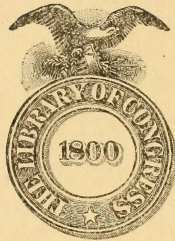


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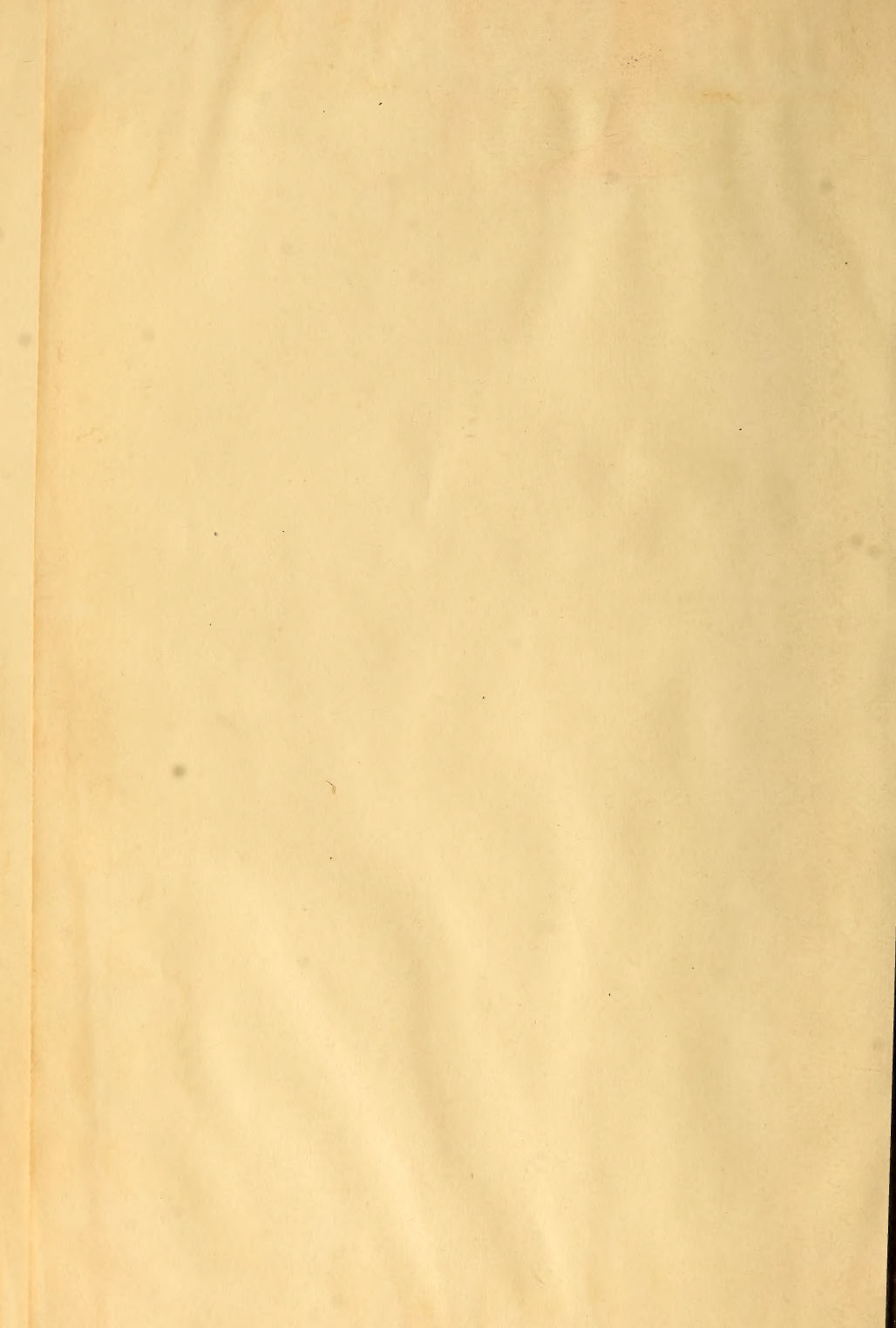
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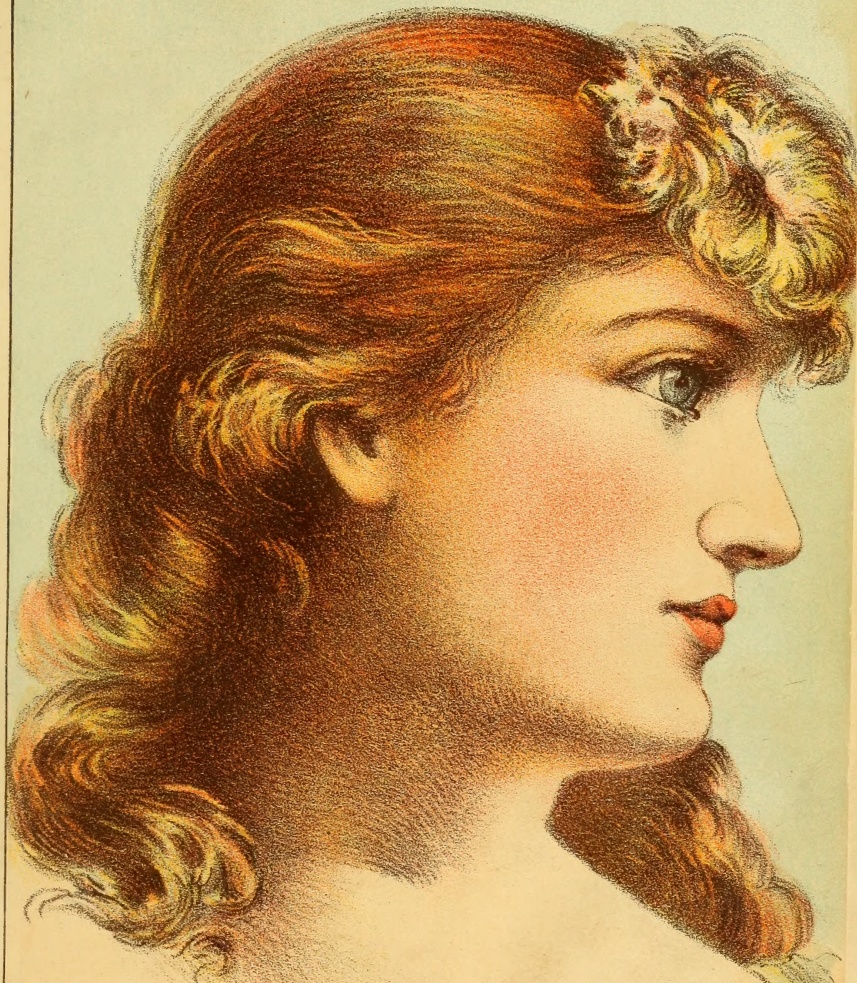
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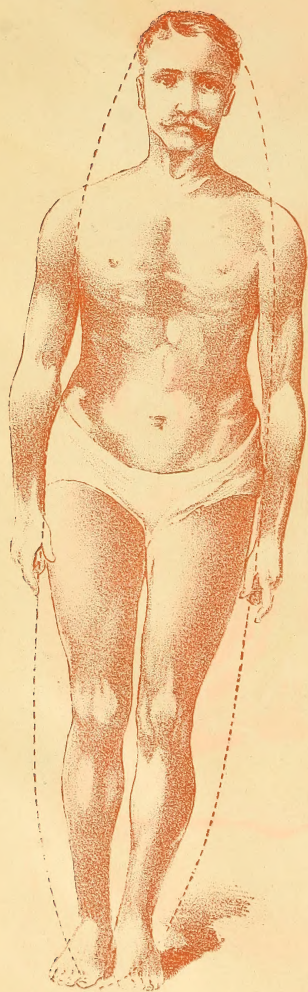
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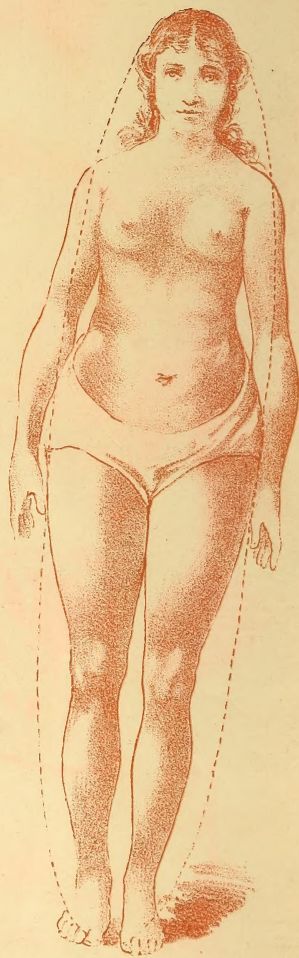




A PICTURE OF HEALTH AND BEAUTY

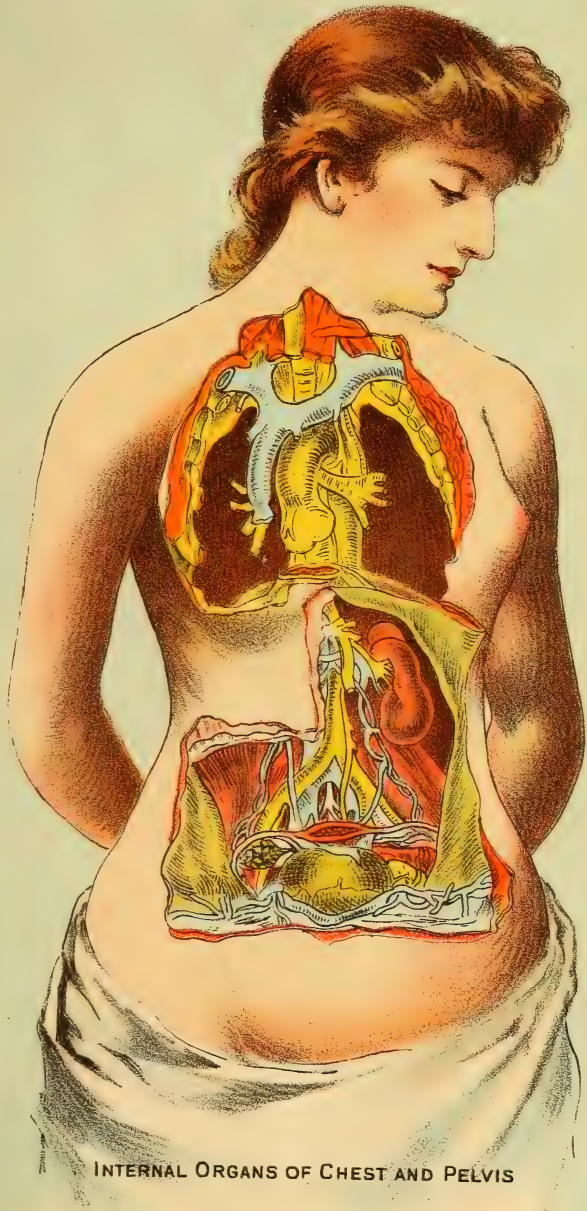


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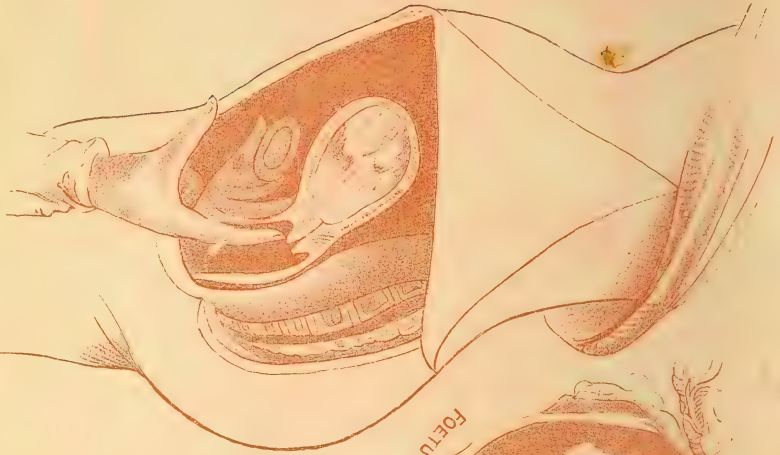


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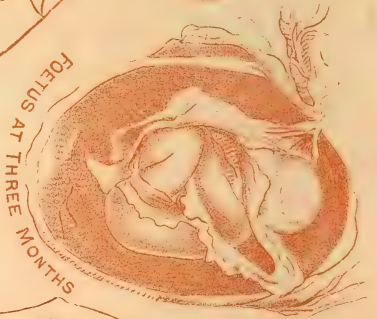
COMPARATIVE FORM AND SIZE



INTERNAL ORGANS OF CHEST AND PELVIS



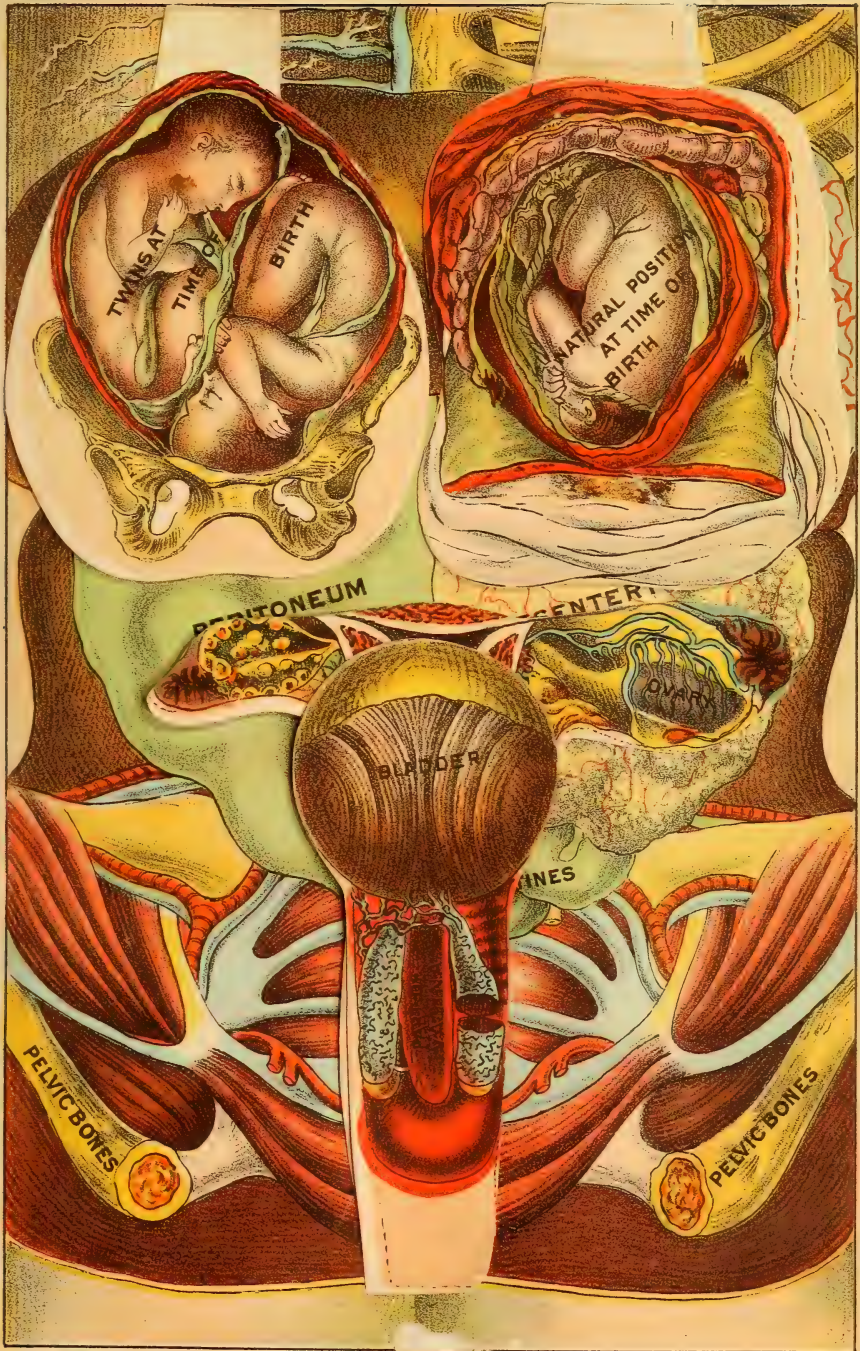
IMPREGNATED WOMB AT 4 MONTHS



FETUS AT THREE MONTHS



IMPREGNATED WOMB AT 8 MONTHS







S. Parcoast M. D.



THE YOUNG MOTHER.

411
1475

BEAUTIFUL WOMANHOOD

GUIDE TO Mental and Physical Development

A Complete Instructor in all the Delicate and
Wonderful Matters Pertaining to Women
INCLUDING

A Practical Treatise on Preservation of Health
and Beauty with course in Physical Culture

By S. PANCOAST, M. D.

Professor of Microscopic Anatomy, Physiology and the Institutes of Medicine in the Pennsylvania
Medical University, Philadelphia

C. B. VANDERBECK, M. D., Ph. B.

Lecturer on Hygiene in the Wagner Institute of Science, Philadelphia, Member of the Victoria Institute
England; Member of American Public Health Association, &c., &c.

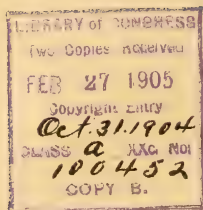
AND

WM. WESLEY COOK, A. M., M. D.

Professor of Physiological Medicine in the National Medical University, Chicago

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Chicago, Ill.



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TO THE
MOTHERS AND DAUGHTERS

OF THE
UNITED STATES OF AMERICA

THIS INSTRUCTIVE TREATISE ON THE STRUCTURE AND FUNCTIONS OF
THE REPRODUCTIVE ORGANS, DISEASES OF WOMEN
AND CHILDREN, THE TOILET, ETC.

SCIENTIFICALLY CONSIDERED
IN REFERENCE TO

HEALTH, BEAUTY AND LONGEVITY

UNDERTAKEN AT THE SUGGESTION OF MANY LADIES AND PROMOTED
BY THEIR ENCOURAGEMENT, IS MOST RESPECTFULLY INSCRIBED,
BY THEIR SINCERE FRIEND AND WELL WISHER,

THE AUTHOR



STATUE OF VENUS.
THE IDEAL OF PHYSICAL BEAUTY.

DESCRIPTION OF PLATES.

A PICTURE OF HEALTH AND BEAUTY.

This exquisitely beautiful and artistically executed plate presents a young woman in the enjoyment of perfect health. Mark the graceful and artistic yet perfectly natural features, note the perfect lines, the healthy compressed lips, the large bright eye, the rosy complexion, the wealth of golden hair, the noble expression, and the natural fullness of the figure, making an enchanting picture of all that is lovely in the human form. Observe the open countenance, how true to nature, how life-like; with no signs of mental decrepitude or exhaustion of any vital forces in the expression of this ruddy and healthy face. It is, as its name implies, "A picture of health and beauty."

COMPARATIVE FORM AND SIZE OF THE MALE AND FEMALE.

This realistic and accurate representation of the male and female, affords an opportunity for the study of their comparative anatomy. Mark the rough muscular form of the male, denoting physical strength and endurance, while the features of the female are perfectly smooth, round, and symmetrical, implying grace, delicacy, and general beauty.

INTERNAL ORGANS OF THE CHEST AND PELVIS.

The attention is fixed in wonder at the marvelous mechanism revealed in this artistic plate. It brings before one's vision the beautiful proportions and symmetry of the female form, and presents some of the most wonderful and important internal organs in their natural positions; it presents a charming picture of loveliness and beauty. Mark the exquisite proportions, the symmetrical figure, the perfect mold and outlines. Our able artist has in the execution of this magnificent plate displayed rare skill and technical

anatomical ability. Observe the lungs, the kidneys, the base of the womb and fallopian tubes with their ovaries exposed. These indeed are organs of paramount importance and of which the author has much to teach in the course of this work.

AN IMPREGNATED WOMB AT FOUR MONTHS.

This artistic illustration gives an accurate and faithful representation of a vertical section of the uterus at four months' gestation. The forefinger is passed into the vagina to neck of the womb for examination of its opening or mouth, which is frequently the seat of inflammations and consequent suffering. It is about this stage of pregnancy (four and a half months) that the first movement of the foetus or "quickening," is perceived.

A FOETUS AT THREE MONTHS.

This artistically executed drawing presents a foetus inclosed in the membranes which form a sac containing the fluid in which the foetus is suspended during its entire course of development. How wonderful are the laws of nature! and yet how essential for the propagation of life. This is an excellent illustration of this early stage of foetal life, and reflects much credit on our able artist.

AN IMPREGNATED WOMB AT EIGHT MONTHS.

This artistic plate presents a perfect illustration of an impregnated womb. A vertical section of the organ has been made showing the membranes or envelope in which the foetus is secreted, suspended in the fluid which gives to the membranes the rounded appearance. Emerging at its posterior surface is seen a portion of the intestines. The forefinger is passed through the vagina to the mouth of the womb, which is partially dilated. This dilatation, at the time of birth, is complete. These carefully-executed draw-



THE HEART'S AWAKENING.

“There is nothing holier in this life of
Ours than the first consciousness of love.”

Longfellow.



IN THE HAMMOCK.

He is coming, and she is happy.

ings, if well studied, will serve to enlighten the reader much on these important subjects.

SECTION OF AN IMPREGNATED WOMB.

This plate presents an exact view of the interior of the womb soon after impregnation. It shows a very early stage of embryonic life, the foetus being inclosed in the membranes, where it remains suspended in the fluid during its development.

UTERUS AT TIME OF BIRTH.

This beautiful and instructive plate presents the gravid womb in its true form and position at the time of labor. The membranes containing the fluid in which the foetus is suspended are slightly protruding down and out of the mouth of the womb, which is now fully dilated to afford exit for the child. On the surface of the womb may be seen the fallopian tube. All the blood-vessels are engorged with blood, and the organ is ready to expel its contents.

TWINS AT TIME OF BIRTH.

This beautiful plate presents a carefully-executed drawing of twins at time of birth, the one being a head presentation, the other a breech presentation.

The blue line denotes the placenta and umbilical cord; the red margin, a section of the womb.

The next chart shows a natural position at time of birth. This position is fortunately the most common, and is rarely attended with much trouble. The blue line, which presents a twisted appearance, represents the cord; the red margin, the womb. The womb being a muscular organ, it contracts from above downward during labor, and thus expels its contents. It is these muscular contractions and the dilatation of the mouth that causes what is known as "labor pains."

ORGANS OF GENERATION.

The next chart presents some very important organs, of which little has ever been said in works of this kind, viz., the VAGINA, URETHRA, CLITORIS, and HYMEN.

Our artist has here again displayed faithful fidelity to nature, and deserves the highest encomium for the careful and successful execution of this interesting and important illustration of these more minute organs. The hymen, which is a thin, semi-lunar fold of mucous membrane, is stretched across the lower part of the orifice of the vagina. It is still supposed by many to exist only in virgins, and to be the only evidence of virginity; but modern scientific knowledge refutes this idea. A careful study of these drawings will be of invaluable interest in connection with the full history of them, given in this work.

The urethra, or rather the orifice of the urethra (*meatus urinarius*), which is so artistically shown in this diagram, is situated at the back part of the vestibule, about an inch below the clitoris, and near the margin of the vagina. Below this orifice of the urethra will be seen the orifice of the vagina—an elliptical aperture, somewhat closed in the vagina by the hymen. The urethra is the outlet for the urine.

How wonderfully artistic, yet how strikingly natural, is shown the clitoris. This small organ is an erectile structure, analogous to that of the *male organ*. It is partially hidden by the labia minora, and in consequence the gland or outer extremity only is seen. It is an elongated organ, and is highly sensitive.

THE PERINEUM.

The next plate presents the back portion, or posterior view of the perineum, the anatomy of which is too complex for the general reader. Suffice it to say here that it is a muscular structure, forming a thin layer. It is subject to laceration in labor, in which case the ruptured edges should

immediately be brought together, and held in position by stitches until reunited.

THE BLADDER.

The next chart shows the bladder and part of the vagina. This important muscular organ, the reservoir for the urine, is situated in the pelvic cavity, the uterus and vagina intervening between it and the rectum in the female. Its shape, position, and relations are greatly influenced by age. It is said to be larger in the female than in the male, is about five inches in length, and three inches across, and the ordinary amount which it contains is about a pint. It is composed of four coats, and is frequently the seat of painful inflammations.

Another well-executed drawing presents the human seminal fluid. The small objects seen are the spermatozoa, greatly magnified. They are the essential agents in producing fecundation. The movement of these minute bodies are remarkable, and consist of a lashing or undulatory motion of the tail. A detailed history of them is given in this work.

No more interesting chart could meet the eye of the intelligent reader than the one next to be considered. We have presented here the vagina, the womb, and the fallopian tubes containing the ovaries. These structures are important, not only on account of their complex functions, but also on account of the numerous diseases to which they are subject. On the left may be seen a vertical section of the ovary. A careful study of these subjects may tend to avert much suffering.

THE WOMB (UTERUS.)

is a strong muscular organ, pear-shaped in the virgin, situated in the pelvic cavity between the bladder and the rectum, and projecting into the upper end of the vagina below. It receives the fecundated ovum in its cavity, retaining and supporting it during the entire stage of development

of the fœtus, and is the principal agent in its expulsion at the time of parturition. It measures about three inches in length, two inches in breadth at upper part, and about an inch in thickness. Its form, size, and position varies at different periods of life, and under different circumstances. It is composed of three coats, viz. : an external serous coat, a middle or muscular layer, and an internal mucous coat.

THE VAGINA.

The vagina is a membranous canal, extending from the vulva to the uterus. It is situated behind the bladder and in front of the rectum. It is cylindrical in shape, and its walls are ordinarily in contact with each other. Its length is about four inches. It consists of a muscular coat, a layer of erectile tissue, and an internal mucous lining.

THE LIVER.

is a large glandular organ, situated in the right hypochondriac region. It is the largest gland in the body, weighing from three to four pounds. It is divided into five lobes, and is intended mainly for the secretion of the bile, but effects also important changes in certain constituents of the blood in their passage through this wonderful gland.

THE STOMACH.

The next plate presents the stomach, a most wonderful organ, and, in order that it may be better demonstrated, both the outer and inner coats are presented. It is the principal organ of digestion. Its size varies considerably in different subjects. Its transverse diameter is about twelve inches; its vertical diameter about four inches, and its weight about four and one-half ounces. It consists of four coats, viz. : a serous, a muscular, a cellular, and a mucous coat, and is supplied with blood-vessels and nerves.

The peritoneum is a serous membrane, which partially

invests all the viscera contained in the abdominal and pelvic cavities, and is frequently subject to important inflammation called "peritonitis."

THE MESENTERY.

The mesentery is a broad fold of peritoneum which serves to retain the small intestines in their position and contains between its layers vessels, nerves, and glands.

The small intestines are that portion of the alimentary canal in which the chyme is mixed with the bile, the pancreatic juice and the secretions of the various glands imbedded in the mucous membranes of the intestines, where the separation of the nutritive principle of the food is effected, which constitutes chylification. The small intestines are about twenty feet in length, the walls are composed of four coats; a serous, a muscular, or cellular, and a mucous coat, and are supplied with vessels and nerves.

THE RECTUM.

The rectum is the terminal part of the large intestines. It is from six to eight inches in length, and, like the small intestines, has four coats.

PUBLISHER'S | PREFACE.

THE eminent ability and professional skill of Dr. Pancoast, the author of this work, are too widely and favorably known in every country to require at the hands of the publishers more than a passing word of commendation. His name has for years been a synonym of strength and success in the practice of medicine—especially so in the diseases of women, to which he has devoted many years of his active life; and many are the ladies who to-day owe to his wonderful skill the blessings of health and happiness.

Dr. Pancoast having his mind early drawn to the physical perfection and beauty of women, gave careful and erudite study to the subject in all its intricate bearings and phases. He lectured on the subject, wrote about it, and availed himself of the many valuable suggestions of his professional colleagues, equally skilled with himself. He studied closely every author who had previously written upon the subject, and thus thoroughly mastered its every detail.

Duly appreciating woman's instinctive modesty, he felt that she should have at hand a reliable instructor, safe counsellor and wise friend—one that she could consult with the utmost freedom in her hours of pain and distress. Thoroughly imbued with this idea, he deemed it his duty to give to her the benefits of his ripe experience and the best results of his practical skill. Hence this work.

PREFACE.

THE present work will be found one of delicate and peculiar interest to every female interested in the health, beauty, longevity, happiness, and general well-being of her sex. It has been written at the especial request of numerous matrons to supply a *desideratum* in medical literature, in respect to the functions and diseases of the Female Organs of Generation.

As the subject of Generation and Procreation is one that must ever largely engross the public mind, particularly every married female anxious for the preservation of her own physical perfection from the exhausting drains upon the *vis vitæ* of the animal economy through gestation, excessive parturition, lactation, etc., the matter of the *Prevention of Conception*—the production of vigorous and healthy offspring—and the removal of the many complicated disorders incident to women and children—should be handled with extreme caution and delicacy by the medical practitioner, whether in the regular routine of his profession, or in giving to the world any treatise or published work on such important elements of human health and longevity. The author, accordingly, takes up the subject in all its intricate bearings, with no little moral diffidence, and with a full consciousness of the responsibilities involved in the faithful execution of his obligations to the female sex and general society. He, however, deems it high time some really *scientific* work should be interposed, in order to render nugatory the prurient and imbecile efforts of medical pretenders who have, of recent years, flooded the country with unreliable literature. He is therefore emboldened to appear

in the literary arena, and proclaim those solemn and important *truths* that so nearly affect the vital interests of the entire human race.

Enjoying advantages possessed, perhaps, by few other physicians in the United States, in respect to information of this peculiar character, the author can safely say that all that is known of a *truthful and reliable* nature will be found embraced in this volume. The book is not intended alone for the female sex, but is a work which every intelligent physician will find an invaluable acquisition to his library, as a reference and guide in his general practice in all complaints and peculiarities incident to females especially.

In these days of progressive intelligence, the author is happy to perceive that the pseudo-modesty which prevailed a few years ago, in regard to subjects pertaining to the sexual organism, is rapidly wearing away, while the glorious science of Physiology in connection with Hygienic information is being universally entertained, as a means by which man may "*know himself*," and realize something of the sublime mysteries and phenomena of his physical and spiritual existence. In truth, *Nature* is ever immaculate, and abhors everything which is repugnant to her pure and simple laws. She has no secrets that may not be revealed to all—whether male or female—none that should ever cause the cheeks of the "pure in heart" to mantle with the crimson hue of shame—none to make man hang his head and fear to contemplate the attributes and perfection of Deity's most elaborate and exquisite piece of workmanship—*man* himself.

The portion of this work devoted to pregnancy will be found full and pertinent, yet lucid and concise—giving advice to females, showing what course they should pursue during that period, as well as after the child is born, together with much valuable information in regard to the management of infants.

All the prominent diseases of females are noted, the symptoms given, and the means for their cure and amelioration

suggested and presented, in order that females generally may be enabled to treat themselves, except in obstinate and complicated maladies.

The chapter devoted to the Female Toilet will be found most useful and attractive to the sex, presenting many curious facts not to be obtained from any other source, while giving remedies for beautifying the skin, etc., that have been tested and approved by many ladies of high rank and fashion in all parts of the world.

A reference to the title of the chapters and to the list of engravings will more fully explain the object and character of this volume. The author believes that it is the most complete work of the kind that has ever appeared. Its matter is intensely absorbing, and can scarcely fail to be highly appreciated by every discreet and intelligent lady into whose hands this *morceau* may fall. If the author can succeed in his present effort to increase the *stamina* of the female organism, strengthen her vital powers, insure her general good health and longevity, elevate her character as mother, wife, sister, friend, and companion, and add aught of embellishment to her natural dignity, grace, and loveliness of physical and intellectual attributes, he will have achieved honors and triumphs sufficient to satisfy his highest ambition as a well-meaning philanthropist, and ardent admirer of pure and lovely *woman*, "Heaven's last best gift to man." He feels, in sooth, that he may safely leave this work on Kalgynomial Pathology in their hands, and await the verdict of a favorable appreciation of his humble labor in their behalf.

S. PANCOAST, M. D.

PREFACE

BY

DR. WM. WESLEY COOK.

THE work assigned to me on this book has been chiefly a rearrangement of its chapters and additions to its already rich fund of information. The collection of facts contained in the original edition surpasses anything ever attempted by any other writer upon this class of topics. These facts are so plainly expressed and so fully explained that it would be impossible to present them in better form. With the additions that have been made by the revising editor, this volume now embraces every subject of known interest and value to womankind regarding her physical being and its care and relationship.

The acquisition of knowledge is always elevating, and womankind can derive only good from becoming acquainted with her true self—physical and mental. When such a work as this present volume can be so readily obtained, it is a great error for anyone to remain in ignorance of the facts which are of such vital importance to human existence.

This seems to be the era of woman's equality with man in all things,—mercantile, professional, intellectual, educational and physical; and the eagerness with which she reaches out for physiological information, and the persistency with which she endeavors to develop her body, betoken the early possibility of her physical superiority.

The information contained in this volume can be relied upon as absolutely accurate, and its acquisition is the greatest educational gift that can be offered to women of all ages—from maidenhood to old age. It teaches the young the mysteries of their being in chaste and truthful language,



QUEEN LOUISE OF PRUSSIA.

A Royal Beauty, a Queen, a Woman a Mother.



"A VESTAL VIRGIN."

"Virtue is bold and goodness never fearful."

and enables them to learn the beautiful facts of procreation as they should be known, free from the inaccuracies and exaggerations that are usually preëminent. For the middle aged it serves as a faithful guide for the preservation of health and the proper rearing of offspring; and following its instructions will enable women to refrain from the use of injurious drugs and to avoid the horrible mutilations of needless surgical operations that are so frequently forced upon them. For those about to enter upon the period of old age it is invaluable; aiding them to prepare for the important changes in their organisms and to insure for themselves peace and comfort in their declining years.

This is truly a Ladies' New Medical Guide and its careful perusal is urged upon everyone desirous of obtaining and preserving knowledge, health and happiness.

DR. WM. WESLEY COOK.

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GRADUATION DAY.

High school girls at graduation exercises often dress in Greek costume.



YOUTH.

"The fairest flower in the garden of creation is a young mind, offering and unfolding itself to the influence of Divine Wisdom, as the heliotrope turns its sweet blossoms to the sun."

Sir J. E. Smith.

INTRODUCTION

To trace the Ariadnean thread of Physiology and Pathology, and develop the mysterious elements which constitute the *vis medicatrix* of the human organism—insuring buoyant health, vigorous physical and intellectual powers, grace, symmetry, elasticity, and every other functional attribute of the human being—is a task which has been undertaken by medical men, philosophers and savants in all ages of the world. Much accordingly is known of the secret and silent workings of Nature—much of the relative phenomena of spirit and matter, as dependent and mutual adjuncts of human existence, constituting a sound mind and a perfect animal organization. Yet, with all our knowledge, we are far from understanding the *true* means by which manly strength and womanly beauty may be maintained in pristine superiority or normal glory and fullness, in accordance with some *definite* or *specific* standard of human longevity and procreation. The ancient Greeks and Romans possessed sound and rational views in respect to the nature and functions of the human being, and instituted many valuable laws and regulations calculated to ensure a hardy race, and the most exalted mental and physical perfection, as well of the feminine as masculine sex. The more modern Germans, also, had similar institutions intended for the highest development of man, while the people of Great Britain to this day retain much of the stamina inherent of their lusty progenitors of Saxon and Norman origin. The contrast especially between the physical attributes of the females of the Albion Isle and those of the United States is eminently in favor of the former. England is renowned for at least three distinct characteristics, as exhibited in the graceful vigor of her trees, the symmetry and fleetness of her horses, and the brilliant *vis vitæ* and exuberant loveliness of her women. The

most beautiful women in the world are found in the realms of the British Empire. Other nations have their lovely women, it is true, but they are exceptions rather than a general rule to what should be the universal law of normal health and grace. There can certainly be no good and sufficient reason why the fair daughters of Columbia should fall so lamentably behind their trans-Atlantic sisters and cousins, if not in intellectual qualities, at least in the essential elements of perfectly developed womanhood. The cause of this inferiority of American females is undoubtedly owing to their improper physical training during the adnascent period of life—to premature marriages—to the cares of too early maternity—to the foolish and ridiculous conventionalities of society—to absurd customs, unjust laws, and a lack of a due appreciation of what should constitute the sphere of the sex, as the procreant instrument for the perpetuation of the human race, agreeably to the sublime injunction and ordinances of the Great Creator and Law-giver of Universal Nature.

Nature, indeed, has implanted in the human breast a delicate sense of perception of the beautiful in general creation; but of all other forms of loveliness, there is none that so much delights and enchants the soul of man as the beauty of the human female. It absorbs the ideal dream of the sculptor and the painter, while many a modern *Praxiteles* and *Apelles* vie with each other to produce such models of perfection as the glorious sculpture of the one and the admirable picture of Venus Anadyomene of the other, both of which masterpieces of art excited the most remarkable enthusiasm among the Greeks. It was from a public exhibition of a most beautiful and perfectly-formed woman named Phryne that each of these works was achieved. The Venus of Praxiteles especially was a *chef d'œuvre* of human imitation. It was so remarkably *true to nature* that the people of the celebrated city of Gnidus fancied that the marble moved, that it seemed to speak, while the illusion was so

great that they ended by applying their lips to those of a cold and insensible representation of a most fascinating woman, which statue they subsequently worshiped as a goddess. This piece of sculpture showed a remarkable knowledge of anatomy—of physical conformation and beauty—on the part of that classic nation. A modern writer on Human Female Beauty recommends all sensible and intelligent females to procure a copy of this celebrated Venus, and study its outline, as what should constitute a perfect female figure, in respect to their own personal improvement and sexual contour and beauty.

This suggestion is an excellent one, and worthy of due consideration by the sex. There is certainly a natural characteristic in every female to desire to be esteemed lovely and amiable, while she may well be encouraged in every means calculated to enhance her charms and accomplishments. All artificial adjuncts to this end, however, will be in vain if she fail to comprehend the law of her being, the purposes of her existence, and remain in ignorance of the processes by which to insure perfect development, and joyous, bounding health. Indeed, no woman can be *beautiful* without the enjoyment of *perfect health*. Each female, therefore, should carefully contemplate the mysteries of her organism, and seek to arrest those abnormal influences which tend to the detriment of her native vigor and physiological perfections. She should know when and whom to marry—when and how often to bear children. She should have the privilege to be the guardian of her own procreative functions, and the right to refuse sexual commerce when considered repugnant to the instincts of Nature, or when found inimical to her health, beauty and longevity. She should have the option to bring only lovely and healthy offspring into existence, while she should be taught to look upon sickly and malformed issue as a crime against Nature, and a grievous offense in the sight of immaculate Heaven.

To facilitate such humane and philanthropic purpose—to

elevate the sex to her rightful and natural position from the degraded creature of man's lusts and caprices—to show her how she may retain her loveliness and physical and mental powers to the latest period of human life—and at the same time improve the future races of man, by reformatory and recuperative elements bearing upon the present generation of men and women, cannot be unworthy the consideration of every true lover and friend of his species. For this end this work is written. Accordingly the author would have his views and sentiments deliberately weighed, and judgment passed upon his performance as it may be deemed beneficial or prejudicial to the general well-being of society. He has only most solemnly to add that he repudiates all evil intentions or improper motives in the compilation of this work, and trusts that if he has misinterpreted his mission in furtherance of human glory and exaltation, he will at least not be placed in the category of those who willfully and wantonly seek to corrupt and destroy the strength and flower of the American nation. He sincerely believes with the Sacred Text, "*That righteousness exalteth a nation, and that sin is a reproach to any people.*" He would especially inculcate the purest virtue and morality, and frown down everything partaking of the prurient, sensual, and revolting. He would save the race from utter debasement, degeneracy and extinction, and replenish the earth with an order of humanity of the fullest physical development and the most transcendent intellectual and spiritual attributes, and thus restore the human creature to his destined position of an Angel of Light, created and fashioned in the image of Deity, the Great Father and Ruler of universal physical and spiritual existences.

WOMANHOOD

CHAPTER I.

THE FEMALE SEXUAL ORGANS.

ANATOMY OR STRUCTURE OF THE FEMALE ORGANS OF GENERATION.

THE generative or reproductive organs of the human female are usually divided into the internal and external. Those regarded as internal are concealed from view and protected within the body. Those that can be readily perceived are termed external. The entrance of the vagina may be regarded as the line of demarcation of the two divisions.

EXTERNAL ORGANS OF GENERATION.

The external organs of generation consist of the *Mons Veneris*, *External* and *Internal Labia*, *Clitoris*, *Meatus Urinarius* and *Hymen*.

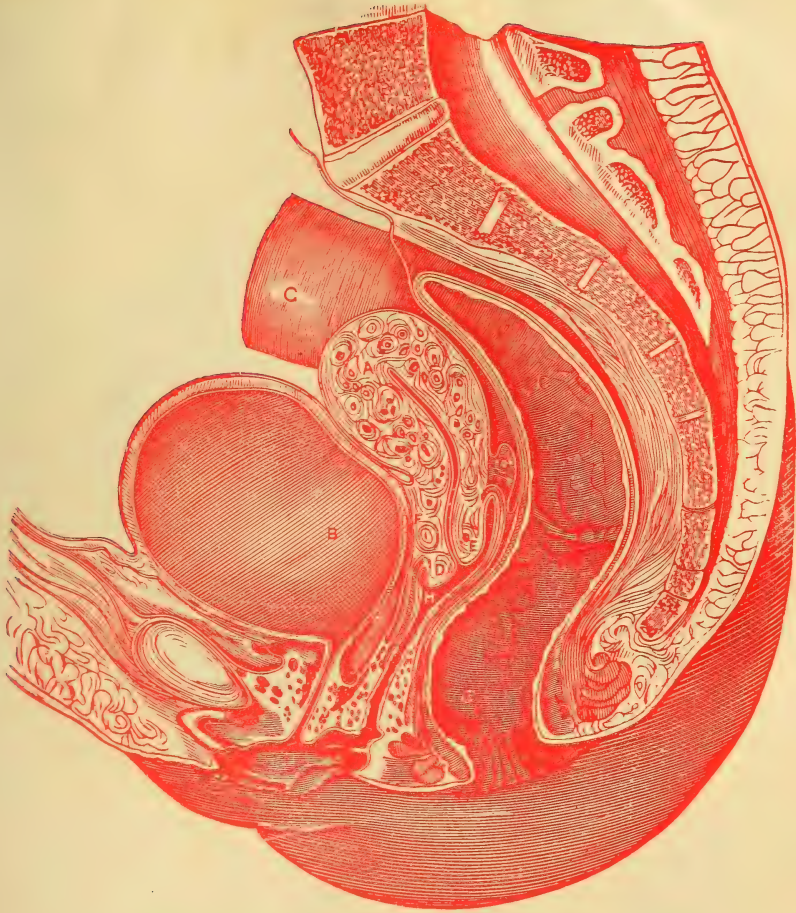
1. **MONS VENERIS.**—This is the prominence situated over the symphysis pubis, consisting of the integuments or skin, (fatty or adipose tissue), and sebaceous follicles, and covered with hair at puberty.

2. **EXTERNAL LABIA.**—The labia majora (large lips) are sometimes called the external lips of the vagina, and close the orifice of that passage, or canal. They are two thick membranous folds, constituting the sides of the external pudendum, and extending from the mons veneris above to the

perinæum below. By their union below the perinæum, they form the forchette or frænum. At the posterior extremity, close to the entrance of the vagina, there is a small depression termed the *fossa navicularis*. Externally the labia majora consists of a delicate skin covered with hair, continuous with that of the thigh and pubic region. The internal surface resembles a mucous membrane; is thin and smooth, of a reddish or pink color in young, and pale in old age; being supplied with sebaceous follicles or depressions which secrete an oleaginous substance. In the virgin both lips are closely united, forming a longitudinal slit. After frequent coition and parturition they remain, more or less, permanently separated by the labia minor (the smaller or inner lips), protruding between them. They are sometimes the seat of swelling and suppuration, which is frequently very painful and distressing to the patient. They occasionally entirely unite, which is caused by ulceration and the close approximation of each labia. They are sometimes found united in this way at birth. The diseases of these parts are frequently the consequence of uncleanness.

3. CLITORIS.—This is a body which is seen immediately below the mons veneris, by separating the external labia. It is usually about one inch in length, and formed similarly to the male penis. It consists of two corpora cavernosa; has a glans, prepuce and double frænulum, but no meatus urinarius. It is situated below the anterior commissure of the labia minor, and is covered by the prepuce. It is attached to the pubic bone or anterior part of the pelvis (*Fig. 1, f*); and by two crura from the ascending rami of the ischia, to each of which an erector muscle is attached. The corpora cavernosa unite under the symphysis pubis terminating in the glans of the clitoris which reaches beyond the prepuce in the shape of a roundish body of the size of a pea. It is united superiorly to the symphysis pubis by means of a frænulum, and inferiorly to the labia minora by means of another frænulum. This portion of the pudendum is richly endowed

FIG. 8.



SECTION OF FEMALE PELVIS AND ITS CONTAINED VISCERA.

A, uterus; B, bladder; C, C, rectum; D, anterior, and E, posterior lip of cervix uteri; F, connective tissue uniting the anterior wall of uterus to the bladder; G, loose tissue between the posterior wall of uterus and rectum; H, vagina.



those of colder zones. Such is its excessive length among the Abyssinian, Mendingan, and Ibbon women, that it is a popular usage to extirpate a portion of the obstruction. When the Abyssinians were converted to Christianity, this species of circumcision was abolished as a remnant of paganism. The men, however, soon rebelled against the innovation, when it became necessary for the Propaganda of Rome to send a surgeon to restore the ancient custom. The clitoris is sometimes four or five inches in length, and of the thickness of a boy's penis prior to pubescence. Such malformation has induced unnatural satisfaction of the sexual instinct between two women, or between a so-called hermaphrodite and a virgin. The so-termed "Lesbian love," or the lustful embraces of women of each other, arose from such abnormal condition of the clitoris. This revolting vice derived its name from the Island of Lesbos, where it was practiced by the celebrated poetess Sappho. In ancient Rome there was a society of these creatures who were called the "Tribades." Prior to the first French revolution, there was a similar society in Paris, who, as if to add mockery to their infamy, called themselves the "Vestals."

4. INTERNAL LABIA, OR NYMPHAE.—These are two distinct folds of membranes lying within the labia majora, (or external lips) and attached above to the clitoris and external labia below. Posteriorly they are closer together than anteriorly; externally they terminate in a cock's-comb-shaped, indented, free margin. They consist of a delicate crimson membrane, richly provided with nerves. Between its external and internal layers is concealed a loose cellular tissue and a number of mucous glands. Each lip divides at the anterior and superior extremity into two crura. The lower ones unite with the clitoris, while the upper ones, above the clitoris, unite and form a sort of cap or prepuce.

In Hindostan, Persia and Turkey they are much elongated, and have to be removed with the knife on account of their interference in child-birth. In labor they protrude,

and are not unfrequently lacerated, at the same time protecting the external labia. Among women, who have borne many children, such elongation is very considerable.

It is only in females in whom they do not protrude, that the labia minora have the rosy color of a mucous membrane. When they protrude they become dry, hard, and assume a brown color. If the sexual organs are abused they become much relaxed, and hang down like flaps of an inch in width. Among the women of the Hottentots and Bosjemans, they are sometimes from six to eight inches long, as described by travelers. Among the northern tribes of Africa, also, they are habitually so long that they have to be cut off.

5. URETHRA, OR MEATUS URINARIUS.—This is the opening into the bladder—about one inch below the clitoris, and one-third of an inch above the upper surface of the mouth of the vagina. The meatus urinarius forms a small, pad-shaped ring. It is situated in a little fossa, or lacunæ, or depression. Many females are under the impression that the urine passes along the vagina. The opening into the bladder terminates externally, and on a line with the external opening of the vagina. The internal labia give an external direction to the current of urine, and thus prevent it from passing into the vagina. It sometimes becomes necessary to draw off the contents of the bladder in females, for a considerable length of time. The patient herself, or some of her female friends, may soon become acquainted with the passage or use of the female catheter and thus obviate the exposure which is very repugnant to a delicate female. The triangular space between the clitoris, meatus urinarius, and labia minora, is termed the *vestibule* of the vagina.

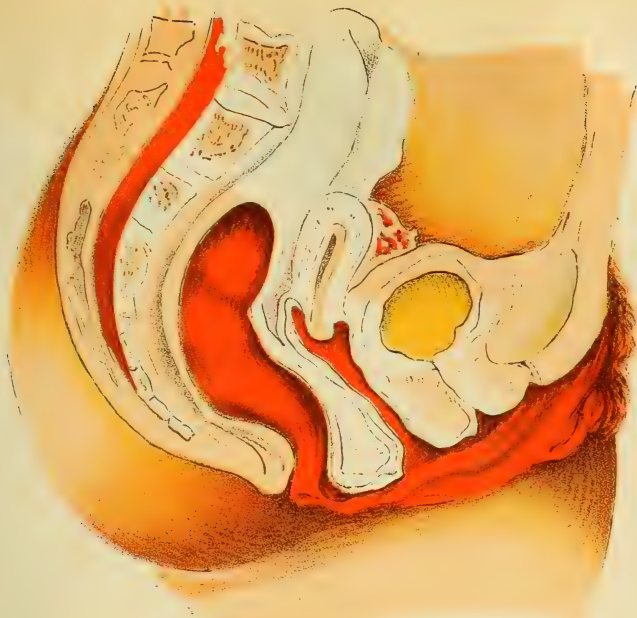
6. HYMEN, OR VAGINAL VALVE.—This is a thin membrane of semi-lunar shape, and stretched across the orifice of the vagina, (*Fig. 1.*) It has generally one or more openings for the passage of the menses. Imperforated hymen has been known to cause great distress in many females, at their first catamenial flow, the discharge of blood completely

blocking up the vaginal canal and extending into the uterus or womb, thus causing hysterical paroxysms and other alarming symptoms. In such cases it must be ruptured and the discharge eliminated. It is usually ruptured at the first sexual congress. Sometimes, however, it is so tense and unyielding as to require the aid of a knife before the sexual act can be accomplished. In virgins the sexual delight is increased even by the pain which the tearing of the hymen causes.

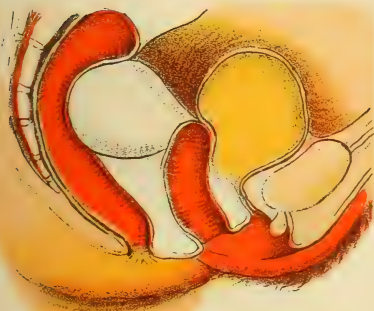
The presence of the hymen was formerly considered a certain test of virginity, on account of its being ruptured during coition. This idea has long since been repudiated, for it is not unfrequently lost through accident, disease, etc. In many instances, it does not give way in the first or subsequent connections and pregnancy. In such cases, the spermatozoa of the male work themselves through the opening in the hymen, and finally pass up through the vagina, uterus, and into the Fallopian tubes, where impregnation occurs. Therefore, medical writers no longer regard the presence of the hymen as proof of chastity, or its absence a proof of immorality.

When the labia and nymphæ are removed, a vascular erectile structure is brought to view, with the contractile muscle which surrounds the mouth of the vagina. These are called *Pars Intermedia*, *Bulbus Vestibule*, and *Constrictor Vaginal Muscle*.

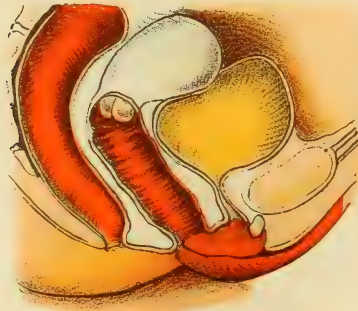
a. *Pars Intermedia*.—This dorsal vein (*Fig. 1, h*) of the clitoris gives off several branches which communicate with other branches given off anteriorly. These veins enter the body of the clitoris by two rows of apertures or canals along its under surface—then afterward pass out of the clitoris, (previously uniting with the veins from the glands of the clitoris, labia and nymphæ), and form a series of convoluted veins, which pass down and terminate in the bulb of the vestibule. This is the structure termed by *Robelt* the *Pars Intermedia*. (*Fig. 1, e*.)



ORGANS OF A WOMAN



**FALLING OF THE WOMB
BACKWARDS AGAINST THE RECTUM**



**FALLING OF THE WOMB
FORWARD AGAINST THE BLADDER**

b. Bulbus Vestibuli, or Bulb of the Vagina.—Lying on both sides of the entrance into the vagina, immediately behind the labia and nymphæ, are two bulbous masses, consisting of tortuous veins enclosed in a fibrous membrane. They are about the size of a chestnut when in a collapsed state. When well-filled with blood they may be compared to a leech, (*Fig. 1, a.*) They are continuous with the *Pars Intermedia* just described.

c. Constrictor Vaginal Muscle.—The clitoris, *pars intermedia*, and *bulbus vestibuli*, are enclosed in a thin muscle, which is called the Constrictor Vaginal Muscle, (*Fig. 1, b. & c.*) The fibres of this muscle interlace with the fibres of the sphincter ani enclosing the mouth of the rectum. The muscle becomes smaller as it ascends, and embracing the vesticular bulb, converges and meets at the root of the clitoris its fellow from the opposite side, where it (the muscle) terminates in a narrow tendon. The office of this muscle is to compress the dorsal vein, and at the same time the lower portion, by compressing the vascular apparatus of the vestibuli bulb, forces the blood upward into the body of the clitoris, and thus producing congestion and erection of that organ.—(*Cyclop. of Anat. et Phys.*)

CHAPTER II.

INTERNAL ORGANS OF GENERATION.

The internal reproductive organs of the female consist of the *Vagina*, *Uterus*, *Fallopian Tubes*, or *Ovaducts*, and *Ovari*.

I. VAGINA.—This lies between the rectum and the bladder, and extends from the external labia to the neck of the uterus. It is about one inch in diameter in virgins, but much larger in those who have borne children. Its length is from five to six inches. The uterine end surrounds the neck of the womb and assists in supporting the same.

The Vagina consists of three coats or distinct membranes—the external being fibrous, the middle muscular, and the internal mucous. The latter secretes a mucus, which, when the female is in good health, is merely sufficient to keep the vagina in a moist condition. When it does more than this, the secretion is discharged externally, and called Leucorrhœa or Whites. In coition this secretion is increased. The vagina in some females contracts powerfully when stimulated by the male intromittent organ, which increases sexual pleasures during the act of copulation. The office of this organ is to receive the seminal fluid and facilitate its passage into the uterus. During menstruation it also voids the catamenial flow, and it likewise transmits the fœtus and placenta during labor.

Abnormal conditions of the vagina occasionally exist. In some instances it has been found wanting, there being no trace of any canal leading to the uterus observed. Sometimes this channel is so narrow as scarcely to admit a goose quill through its length, but such cases, however, are very rare.

A vertical septum occasionally divides the vagina through

its whole course, thus exhibiting a double vagina and a double hymen. (*Fig. 2.*) Such malformation, however, does not prevent conception or parturition. In other in-

FIG. 2.



The body of the uterus divided into two halves, which are united at the cervix by a horizontal commissure representing the fundus. The os uteri and vagina are double.

stances, a transverse septum may obstruct the vagina more or less completely. Such obstruction is seldom perfect; hence, as there is usually some perforation, there may be no hindrance to impregnation. Such blockade may occur at any part of the vagina, and may result from the membranous folds being unnaturally developed, or it may occur from inflammation attendant upon disease or labor. If these septums are complete, leaving no perforations, serious results may arise from the accumulation of the menstrual secretion. Laceration may occur during pregnancy, while fistulous openings into the rectum or bladder may be formed.

The vagina is liable to various forms of disease, such as inflammation, ulceration, abscess, mortification, etc.; while cysts and tumors are not unfrequently found, all of which will be alluded to when describing the diseases of the organs of generation.

2. UTERUS, OR WOMB.—The unimpregnated uterus lies entirely within the pelvis—the bladder being in front, the rectum behind, the Fallopian tubes on each side, or laterally, and the vagina below. (*Fig. 3.*) The form of the uterus has been compared to a flask with its mouth turned downward; also to a pear, or a truncated cone. Perhaps a flattened pear will convey the best idea of the natural appearance of the organ.

The uterus does not attain its full size or development until the period of pubescence. Previous to this time it is not much altered from its infantile condition. As the period of puberty approaches, there will be a gradual enlargement of the mammæ, which fact will indicate an increase in the bulk and weight of the uterus. After this period of development, it remains of the same size throughout life in the unimpregnated female. The average size of the womb at puberty, or after it has attained its full growth, is three inches in length, and two in breadth at the points of attachment to the Fallopian tubes. The diameter of the neck is much less, being usually about one inch.

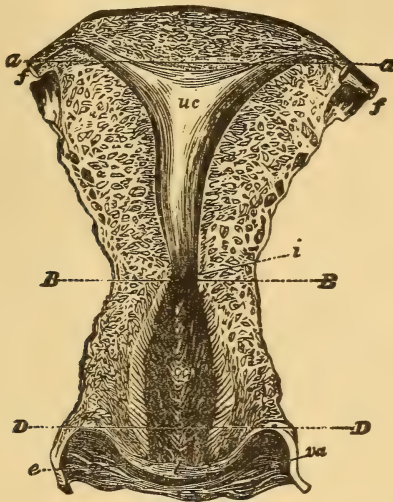
The uterus is usually divided into three parts—called the fundus, body, and neck. The *fundus* is that portion above the insertion of the Fallopian tubes. It is very dense, (*Fig. 4, a a.*) and firm in texture. It is a portion the least subject to disorganization from any cause. Other portions of the womb are liable to be destroyed by carcinomatous or cancerous ulceration, while the fundus remains uninjured. On the other hand, it is the part of the organ to which polypi that are not cervical are found adhering. It is to the fundus, also, that the placenta is most usually attached.

The *body* of the uterus is included between the line above indicated and another (*Fig. 4, B B*) drawn through the narrowest part of the organ, or where the walls of the womb are in closest approximation. The body constitutes the principal portion of the uterus, and is that part which expands more than any other to invest the ovum. The walls are usu-

ally half an inch thick and well supplied with blood vessels.

The *cervix*, or neck, (*Fig. 4, c c*) is cylindrical in shape, and composed of tissue similar to the body of the uterus. The walls are about the same thickness as the body, but do not approximate, thus leaving a spindle-shaped cavity called the canal or cavity of the cervix. The part below the line

FIG. 4



VERTICAL SECTION OF NULLIPAROUS UTERUS PARALLEL WITH ITS ANTERIOR AND POSTERIOR WALLS.

u, c, uterine cavity; *c, c*, cervical cavity or canal; *i*, internal os uteri; *e*, external os uteri; *f, f*, Fallopian tubes; *v, a*, vagina. (*Ad. Nat.*)

(*D, D*) projects into the vagina and is called the *vaginal* portion. Around its base, the walls of the upper surface of the vagina is attached; hence, the neck does not lie immediately within the vaginal canal, but projects from its upper wall, and is there seemingly suspended. Sometimes the projection is so slight that there is difficulty in bringing the

cervix or neck into view by means of the speculum. The position of the neck prevents the part from injury in coition. At the apex of the neck is observed a transverse fissure which is the terminal end of the cervical canal. This opening is called the os-externum uteri, or the external orifice of the cervical canal. (*Fig. 4, e.*) This external orifice of the womb is bordered by two smooth lips, which are distinguished as the anterior and posterior lips of the os-uteri. The anterior lip is the smallest, and projects but slightly into the vagina. This unequal form of the two lips has given rise to the term os-tincæ—the orifice of the uterus. In the virgin this part of the uterus is smooth and firm, like soft cartilage. After the birth of many children, it becomes much enlarged, soft, flaccid and of irregular form. The uterus being a hollow organ, possesses both an internal and external surface. The external surface is partially covered by a reflection of the peritoneum, which is a dense, smooth fibrous tissue that lines the whole abdominal cavity. It is by the reflection of this membrane that the broad ligaments are formed which we shall presently describe. The internal cavity of the uterus in the unimpregnated state is nothing more than a narrow triangular interspace between flattened walls, which are either in immediate contact or are separated slightly from each other, and the space filled with mucus. The Fallopian tubes after passing into the uterus expand trumpet-like, and meet the cervical canal opening upward, and the three openings expanding in this way, thus form the triangular cavity of the uterus.

By studying the form of the cavity of this organ, all the phenomena of the entrance of the ovum into the uterus and its detention there before it becomes detached to the uterine walls, may be perfectly understood. This cavity is lined by a mucous membrane of a pale pink color, except in cases where death has occurred during menstruation, when it is of a deep red hue. This membrane is not smooth, as it appears to be when viewed with the naked eye, but is perforated



NIGHT.

“Empress of Silence and Queen of Sleep.”



THE DOUBLE STAR.

“Golden candles fixed in heaven’s air.”

Shakespeare.

everywhere by the orifice of minute canals or follicles. (*Fig. 4, i.*)

The membrane lining the cavity of the cervix or neck of the womb is arranged in numerous folds or plicæ, (*Fig. 4, c. c.*) which gives a large amount of secretory surface to a comparatively limited space. This mucous membrane is largely supplied with crypts or follicles, which secrete copiously when diseased.

After repeated pregnancies these folds become prominent and thickened, presenting a bulbous appearance, resembling the branches of a tree; hence the origin of the old term *arbor vitæ*, by which this structure was commonly designated.

As before remarked, the internal surface of the uterus presents, when examined under a microscope, a large number of small follicles or canals, which pursue a tortuous or meandering course and ramify in the substance of the mucous membrane. Besides these mucous canals there is a number of small closed follicles, which have an important bearing upon the functions of the uterus, as will be explained in another place.

All mucous membranes are formed of cells called epithelium, and arranged in several layers of cells or in a single layer. The single layer is called the cylindrical epithelium, while the several layers are called pavement or scaly epithelium. To some parts of the cylindrical epithelium there is a small fibre-like appendage or projection, which modification is called cilia. The cilia are in motion in the living body, which motion resembles the appearance of a field of grain when influenced by the wind, causing an undulating or wave-like oscillation.

The vagina and outer portion of the cervix is covered by the scaly epithelium, which form of epithelium is never ciliated. Within the cervical canal the epithelium changes its form, becoming cylindrical and ciliated. Above the cervix it again becomes changed to the pavement or scaly epithelium. It will be necessary to allude to the different forms

of the epithelium of the uterus when treating of leucorrhœa and conception.

It is supposed that the movement of the cilia is to assist the spermatozoa of the male semen in passing into the uterus through its cervical or narrow portion. Immediately below the epithelium membrane and upon which it rests is a thin layer of albuminous liquid, called basement membrane, containing numerous granules, which form the nuclei of the cells of which this membrane is composed. This liquid is the matrix of these cells, and is derived from the blood-vessels, which form a capillary network, underlying the whole epithelium surface.

The lining membrane of the uterus, with its crypts and ramifying follicles or canals, secrete a mucus, which is eliminated or poured out upon its surface, keeping it in a moist condition, when the female is in good health. When the same membrane is inflamed, or irritated, the secretion is increased and changed, constituting disease.

The body of the uterine walls consist of muscular tissue, lined, as before stated, on the outside, by reflections of the peritoneum, which line the whole abdominal cavity, and internally by the epithelium or mucous membrane. This portion of the uterine walls is remarkably firm and solid, and constitutes the greatest bulk of the organ.

All muscular fibre in the living body possess inherent contractile power, which is made manifest when a stimulus is applied. In the uterus, after the fœtus has arrived at maturity, which is nine lunar months, there is a peristaltic contraction taking place, but which does not extend to all parts of the muscular tissue of the uterus alike. The object is to press out the contents of the cavity; hence the contraction or force must be applied to the fundus and body of the uterus, while that of the cervix becomes relaxed. In this way contraction of the upper and relaxation of the lower part of the uterus continues until the fœtus is expelled into the vagina. The contractile power of the uterine walls

is dependent upon an exciting cause—which cause is, no doubt, that of the fœtus increasing in innervation or nerve-force, which acting upon the muscles causes the peculiar contraction in child-birth. The uterus is largely supplied with blood-vessels, lymphatics and nerves. The nerves are derived from the spinal and sympathetic nervous system.

3. **LIGAMENTS OF THE UTERUS.**—These terms are applied to several duplications of the peritoneum, as well as to strands or bands of muscular or fibrous tissue. The ligaments connect together the appendages of the uterus, support it, and limit its motion within the pelvis. There are four of these ligaments—the round, broad, utero-sacral and the utero-vesicle.

a. Round Ligaments.—These are sometimes called the sub-pubic ligaments. They consist of flattened cords or bands of muscular and fibrous tissue. These bands arise in the tendons of the internal oblique and transversalis muscles of the abdomen, near the symphysis pubis, or front bone of the pelvis, and are inserted into the uterus near the commencement of the Fallopian tubes. (*Fig. 5.*) The ligament of the right side is generally shorter than the left. Hence in pregnancy the uterus usually inclines to that side. The round ligaments are composed of smooth muscular fibres arranged in bundles and derived from the uterus.

b. Broad Ligaments.—The peritoneum, after covering the front, back and fundus of the uterus, extends off in two folds or layers to the side and base of the pelvis, to which they are attached. By the arrangement of these ligaments the cavity of the pelvis is divided into two chambers—the anterior one containing the bladder, and the posterior, or deeper, holding the rectum and portion of the small intestines—while the uterus occupies the septum between them. (*Fig. 3.*)

To the upper border of the broad ligaments are three folds, called the lesser wings. The central or superior of these contains the Fallopian tubes, and is called the mesen-

tery of the tubes. The smaller posterior fold invests the ovary, together with its proper ligament; while the third or anterior fold inclines obliquely toward the uterus, and constitutes the covering of the round ligaments. (*Plate 5.*) Between the laminae or folds of these ligaments are found the blood vessels, lymphatics and nerves, which supply the uterus and its appendages. The broad ligaments are considered by some writers more as a mesentery than a ligament, on account of their investing the uterus. Its appendages are attached to the pelvis in the same manner as the mesentery attaches the intestines to the spine—the space between the folds sufficing for the conveyance of the blood-vessels and nerves.

c. The Utero-Sacral Ligaments.—From the back side of the neck of the uterus, two folds of peritoneum proceed toward the rectum. Between these folds are two corresponding bands of fibrous tissue which extend from the substance of the neck or cervix of the uterus and are inserted into the sacrum. The office of these ligaments is to prevent the womb from being forced upward in the act of conjunction, and to limit the descent of the organ in erect posture of the body.

d. The Utero-Vesicle Ligaments.—Opposite to the point of junction of the body and neck of the uterus, where the peritoneum is reflected forward on the bladder, are observed two lateral folds containing bundles of fibrinous tissue. These constitute the anterior or utero-vesicle ligaments.

4. FALLOPIAN TUBES OR OVADUCTS.—The Fallopian tubes are the excretory ducts of the ovaries, as the vas deferens are the excretory ducts of the testicles. The Fallopian tubes differ from the vas deferens, as well as every other excretory duct in the animal economy, on account of being entirely detached from the glands or ovaries. The Fallopian tubes or oviducts are equally developed on both sides of the body in all vertebrate or back-bone animals, except in the class of Aves or birds. (*Fig. 26, g.*) With this class the right tube

becomes atrophied at an earlier period, while the left continues to develop.

Each oviduct has the form of a conical tube, the base of which being free and directed toward the ovary, while the apex is attached to the uterus. The shape of the tubes resembles a horn or trumpet, particularly when straightened out. The length of these tubes varies in different subjects, but the average length is four and a half inches. The diameter of the tubes will only admit of a bristle, but the canal at its external or free surface will admit of a quill of ordinary size. The outer edge of the tubes are broken into a number of fringe-like processes of unequal length, constituting the fimbriated portion, or *corpus fimbriatum*, in the center of which is seen the orifice called *corpus abdominali*. The tubes themselves are composed of strong fibrous tissue, similar to the uterus, and are invested like the latter organ, with the peritoneum, by being placed between the folds of the broad ligaments as before described. The internal coat is a mucous or epithelium membrane, but different from that which lines the uterus. Here are found no crypts or follicles as exist in the lining membrane of the uterus, but a very delicate pink layer of undeveloped tissue, mixed with numerous formative cells.

Under ordinary circumstances, and when these organs are in health, the canals of the Fallopian tubes contain only a small quantity of viscid mucus. When death takes place during the menstrual period, this fluid is found to be replaced by uncoagulated blood of a dark color. The fimbriated portion or *infundibulum*, performs an office of more importance than it usually has the credit of doing. It is this portion of the tube that grasps the surface of the ovaries, receiving and conveying the ova to the uterus.

From the illustrations given in works a very poor idea of the beauty of this structure can be obtained. To comprehend the wonderful peculiarity of the delicate plicæ or fringes with which the expanded mouthpiece of the tubes are

beset, they should be examined under water. When thus inspected in the young and healthy subject, the funnel-shaped projections are arranged in numerous folds and leaflets, which are merely continuations of the similar plicæ which line the cavity of the tubes. The office of these delicate and down-like folds is doubtless to receive and entangle the delicate ovum in one of the numerous channels which are formed between the leaflets and to conduct it into the cavity of the tube toward which they are diverged. (*Plate 6.*)

There are a great variety of forms of these funnel-shaped projections—no two subjects presenting the same appearance. They seem to bear a certain relation to the age of the persons in which they are found. In the young subject at the age of puberty, and in those who have borne a few children, they exhibit that richness and profusion of folds already described.

Tube-ovarian Ligament.—This so-called ligament consists of one of the fimbriæ prolonged upon the outer margin or base of the broad ligament or mesentery of the tube. (*Fig. 6, d.*) It was supposed by the older anatomists that the office of this ligament was to draw the end of the tube upon the ovary. This view is not entertained at the present day. Its office is to keep the fimbriated extremity of the tube within a certain distance of the ovary, and permit the orifice to be easily applied over the gland or ovary when it is required. By this arrangement the tube is enabled to enclose any portion of the ovary that may be needed. The length of this ligament is one and a half to two inches in length.

5. OFFICE OF THE FALLOPIAN TUBES.—The Fallopian tubes perform a double office, receiving the ova from the ovaries, and conveying them into the uterus and also receiving the spermatic fluid of the male and conveying it from the uterus in the direction of the ovaries, the tubes being the seat of impregnation.

FIG. 6.



LEFT FALLOPIAN TUBE FROM AN ADULT.

a, fimbriae; *b*, body of the tube; *c*, abdominal orifices, *d*, tubo-ovarian ligament and fringes, *e*, commencement of the tube; *f*, tubal mesentery or broad ligament; *g*, ovary; *h*, ligament of the ovary; *i*, uterus; *j*, round ligaments.

These conclusions are derived from observation upon mammalian animals as well as the human female, the functions in either case being essentially the same. It is accordingly quite clearly demonstrated that the office of the fimbriated extremities of the Fallopian tubes is to become expanded over a certain portion of the ovaries—the extent of the surface depending upon the relative size of the ovaries.

In some mammalia, as the cat, for instance, the extremity of the tube is sufficiently large to encompass the entire ovary, so that an ovum escaping from any part of its surface, will be conveyed or fall into the orifice, and be drawn into the canal. In many other animals, however, as well as in the human female, the size of the tubes is only large enough to cover one-third or one-half of the ovary at one time, so that, in all cases, a selection must be made of the exact spot where the ovum is discharged, or else the ovum will be lost by falling into the cavity of the abdomen.

Sterility in the female is sometimes caused by a morbid adhesion of the tube to a portion of the ovary. By what power the mouth of the tube is directed toward a particular portion of an ovary from which the ovum is about to be discharged, remains entirely unknown, as does also the precise nature of the cause which affects this movement.

The tubo-ovarian ligament (*Fig. 6, d.*) serves at all times to keep the extremity of the tube in contiguity with the ovary, but by what agency the orifice of the tube is drawn toward and the fimbriæ become expanded upon the ovary cannot be satisfactorily explained. The only way to account for the movement is the contraction of the low constrictile form of fibre of which this ligament is composed, which is found in some of the lower-order animals. It was formerly supposed that the approximation of the mouth of the tube and the ovary occurred under the influence of sexual orgasm—an inference natural enough so long as it was believed that the ova were discharged from the ovary during and as a consequence of sexual congress. This cannot, with our pres-

ent knowledge of physiology, be admitted; for it is now a well-settled fact, that in all mammalia, including the human female, the discharge of the ova or eggs takes place during the menstrual discharge and not during sexual congress. The approximation of the Fallopian tube to the ovary at such times is to be regarded as a movement providing for a safe passage of the ova to the uterus, and not that the venereal orgasm is the cause of the movement.

The period of time occupied for the passage of the ovum through the tube is usually a few days. In the bitch, the ovum remains in the tube susceptible to impregnation during six or eight days. In the guinea-pig and rabbit, the ovum makes its transit in about three days. Less is known respecting the time of such passage in the human female. With the exception of abnormal cases, there are but two instances recorded in which the human ovum has been actually seen on its passage to the uterus.

An attempt has been made to ascertain the time an ovum is passing in the human female, by comparing the condition of early ova found in the uterus or prematurely expelled from this organ, with the last known date of intercourse or of menstruation, but neither of these modes of calculation can afford any certain information. The analogies furnished by observation with the higher order of animals lead to the supposition that the time occupied for the passage of the ovum through the tube in the human female is not materially different from that of animals, which is from six to twelve days.

The office of the tubes, as before intimated, is twofold, namely, the passage of the ovum from the ovaries to the uterus, and for the conveyance of the spermatozoa toward the ovaries. The rapidity with which the spermatic fluid is capable of reaching and entering the Fallopian tubes in some animals is very remarkable. *Bischoff* observed spermatozoa in the oviduct of a guinea-pig in three quarters of an hour after coitus. The power by which the semen reaches

the tubes is partly by its ejaculation from the male organ toward the mouth of the uterus, and by the ciliary covering of the membrane lining the neck of the womb, which assist the movements of the spermatozoa to ascend into that organ by their own inherent power. In this way they are enabled to pass up into the tube, where their progress is then arrested by the cilia lining, the tubes having a downward movement for the purpose of conveying the ova toward the uterus, and retarding the movement of the spermatozoa. By this arrangement of the ciliated lining membrane, the egg or ovum and spermatozoa are brought together in the middle and lower third of the Fallopian tube, where impregnation usually occurs.

This explanation properly belongs to the article on Conception, to which the reader is referred.

In order to show the precise limits of the function of the oviducts, it will be necessary to examine particularly the evidence which serves to show that the ovary is the part in which the ovum is formed, and that the uterus is the place in which it is inverted or developed; and also that the Fallopian tubes are the conducting media by which the ovum is transmitted from the formative to the recipient organ; likewise that these tubes are the seat where the ovum becomes impregnated by contact with the spermatozoa while on its passage to the uterus. (*Fig. 5.*) One of the most remarkable circumstances connected with the generative process is the periods of separation of the ova from the ovary and their passage along the Fallopian tubes to the uterus, which will be more particularly explained in the article on Conception.

DEFECTS IN THE STRUCTURE OF THE FALLOPIAN TUBES.

Chaussier mentions the case of a woman who, notwithstanding she had but one ovary, one Fallopian tube, and one side of the uterus absent, had borne ten living children.

Her death having occurred a short time after the birth of her last child, a good opportunity was afforded for examining the parts, when this curious fact was abundantly established. Hence the absence of one tube and ovary will not cause sterility, although such a misfortune must necessarily follow when they are entirely wanting. Sometimes the tubes are short and there may be an absence of the fimbriæ. The former might not cause sterility, but the latter would.

Adhesions not unfrequently take place from inflammation between the tubes and peritoneum and intestines, which is apt to displace the arrangement of the parts. This is one of the most frequent causes of sterility, and is of that nature that cannot be obviated. The tubes may become distended with blood accumulated from the menstrual flow. A case of this kind is stated in the American Journal of Medical Science, No. xxxv. It is that of a woman who, after her second confinement, had an attack of inflammation of the uterus, which terminated in a union of the uterine walls. Behind this obstruction the menstrual flow accumulated, until the Fallopian tubes became enormously distended, when, at length, one of them burst, thereby causing death from the escape of blood into the abdominal cavity.

6. OVARY.—The ovaries constitute the glands appropriated to the formation of the female ova or eggs. The ovary is not fully developed until about the period of puberty. It is usually about the size of a large chestnut when fully developed, their weight being about one-quarter of an ounce. They lie imbedded in the broad ligaments between the uterus and fimbriated extremity of the Fallopian tubes. Besides the connection which it has to the uterus through the intervention of the broad ligaments, it has another uniting it to the womb, known as the *ligamentum ovarii*, or ovarian ligament, (*Fig. 6, h*) while it is also connected to the Fallopian tube by another ligament called *tubo-ovarian ligament*, already described. (*Fig. 6, d.*)

FIG. 7.



OVARY ENLARGED FOUR TIMES THE NATURAL SIZE, AND DISSECTED TO SHOW.

A. peritoneum; B. tunica albuginea; C. stroma; D D D D, Graafian follicles in various stages of growth; E e, outer coat of the follicle; F F, inner coat of the follicle; G G G, epithelial lining or membrana granulosa; H H, ovum and cumulus; I, orifice by which the follicle has discharged an ovum; K, Fallopian tube; L, fimbriae; M, broad ligament; N, tubo-ovarian ligament; O, ligamentum ovarii.

During pregnancy the ovaries change position. As the uterus expands it carries them along with it into the abdominal cavity.

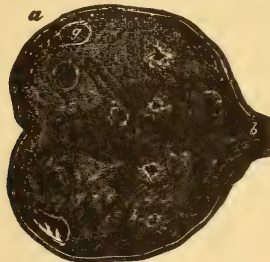
Structure of the Ovary.—The ovaries, like the uterus and Fallopian tubes, are covered with the peritoneum, derived from broad ligaments, which form their outer covering. (*Fig. 7, a. a.*) Below this outer coat, we find another composed of dense fibrous tissue, and called the *tunica albiginea* or *tunica propria*, (*Fig. 7, B. B.*) This forms a complete investment for the ovary.

After removing this investment or tunic another is brought into view, which is called the stroma or parenchyma. It lies immediately below the tunica proper. (*Fig. 7, c.*) thus forming a bed for the germs, and protecting the ova from injury. This structure is largely supplied with blood-vessels, which give it a bright red color. When the microscope is applied to this structure it will be found to consist of blood-vessels principally—the space between the vessels being filled up with fibrous tissue, which bind the vessels together.

OVASACS OR GRAAFIAN VESICLES.

On cutting into a healthy ovary of a subject not too far advanced in life, a number of small vesicles or bladders (so

FIG. 8.



LONGITUDINAL SECTION OF ADULT OVARY

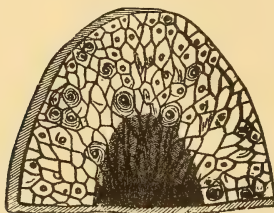
a, distal; *b*, proximal end; *s*, stroma; *g*, Graafian follicles of the ordinary size before enlargement; *h*, stellate remains of follicles which have burst and shrunk after discharging their ova,

small as to require the aid of the microscope to see them) may be readily separated. These vesicles are named after De Graaf, their discoverer. In infants and young subjects these vesicles or ovasacs are found only upon the periphery, (*Fig. 9*) where they form a thick rind. The spaces between them are filled with blood-vessels and fibrous tissue, the latter affording support for the vessels, and is called, as before stated, the *stroma*.

After puberty these ovasacs become buried deeper in the structure, even to the very base of the organ. They are always, however, the most numerous upon the outer surface. The number of developed vesicles in each ovary visible to the naked eye was formerly computed at from twelve to twenty, while it was supposed that when these were exhausted by child-bearing and miscarriage, the power of procreation ceased. Recent and careful observation, however, has shown that the number of vesicles in each ovary amounts to thirty, fifty, one hundred, and even two hundred, while in very young subjects the number exceeds all computation.

The vesicles are most easily seen in the adult ovary by making a perpendicular section. In this way from ten to twenty may be brought in view. (*Fig. 8*.) A similar section in the ovary of an infant, and examined with a microscope, will reveal several hundred. (*Fig 9*.) Each Graa-

Fig. 9.



fian follicle or ovasac is of an oval form, the contents of which will be now carefully analyzed in order to have a clear comprehension of the changes which occur in them

during pregnancy and which result in the formation of the body termed the *corpus luteum*.

STRUCTURE OF GRAAFIAN FOLLICLE.

Each Graafian follicle is lined by three distinct membranes:—

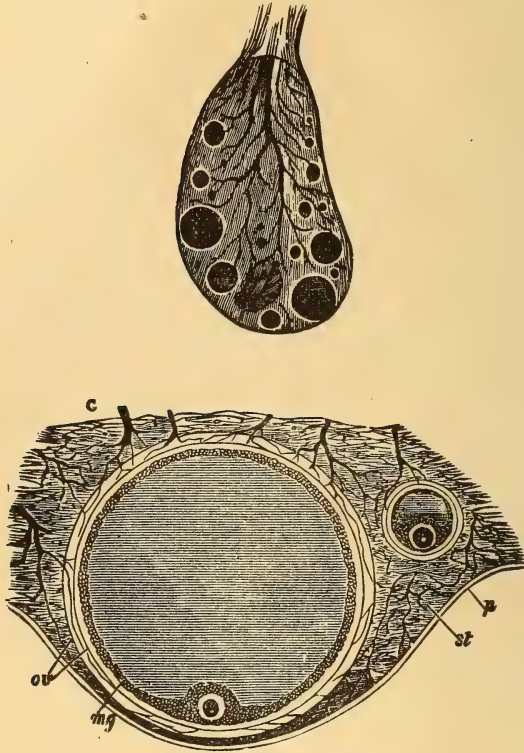
a. External, Fibrous or Vascular.—(Fig. 7, E., and Fig. 10 o, v.) This membrane closely embraces the ovasac and is derived from the parenchyma or stroma of the ovary. If examined with the microscope, it will be found very vascular. Its office is to give increased support and protection to the ovasac which it surrounds.

b. Second or Middle Coat.—This is an independent membrane, and in uniting with the external, forms the Graafian follicle. (Fig. 7, F. F., and Fig. 10, o. v.)

c. Internal Lining, called Epithelial Membrane, or Membrana Granulosa.—(Fig. 7, G. G., and Fig. 10, m. g.) This membrane consists of nucleated cells forming an epithelial lining, the cells of which are so lightly held together that it is doubted whether it is entitled to the name of membrane. This structure plays an important part to the ovum, which is always found lodged within it. As the ovasac develops, this membrane arranges itself into three distinct layers of granules. The *membrana granulosa* forms the outer layer. (Fig. 11, c.) The second portion aggregates around the ovum, constituting its special investment. This is called *tunica granulosa* of Barry. (Fig. 11, e.) The third collects to form a structure composed of the central mass, in which the ovum is imbedded, corresponding with the cumulus of Baer (Fig. 7, H. H.), of certain cords or flattened bands, from two to four in number, which pass off from the central mass outward, to become united with the *membrana granulosa* lining the Graafian follicle. These bands or cords are termed by Barry the *retinacula* (Fig. 11, d. d.), from their supposed office in suspending the ovum and retaining

it in its proper situation in the Graafian vesicle. These bands are not a necessary structure for they are deficient in some animals. As this part of the descriptive anatomy seems in-

FIG. 10.



LONGITUDINAL SECTION OF HUMAN OVARY.

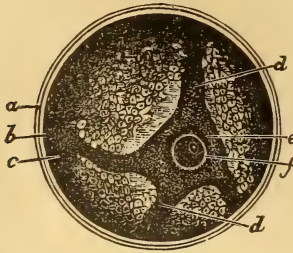
B. Transverse section of human ovary, to show the general arrangement of the developed Graafian follicles toward the surface; twice the natural size.

SECTION OF TWO GRAAFIAN FOLLICLES IN THE HUMAN BODY

C. Diagrammatic representation, in section, of two Graafian follicles in different stages of advancement in the ovary of a human female, enlarged about ten diameters. *p*, peritoneal covering of the ovary; *st*, ovarian stroma; *ov*, the two layers of the ovasac; *mg*, membrana granulosa, near which is the discus granulosis, with the ovum imbedded.

tricate and difficult for those unacquainted with the structure of these parts, a more general and familiar explanation

FIG. II.



GRAAFIAN VESICLE OF THE RABBIT X 100 DIAMETERS.—(After Barry.)

a, outer coat or tunic of the ovasac; *b*, ovasac; *c*, epithelial lining or membrane granulosa, a portion of which has been removed in order to display, *d d*, retinacula (here too distinctly marked); *e*, tunica granulosa of Barry immediately surrounding the ovum, consisting of, *f*, zona pellucida, within which is the yolk and germinal vesicle and macula.

will be presented to the comprehension of the ordinary reader.

The ovary may be compared to a honey-comb, the walls of the comb formed by stroma or parenchyma, as already described, lining these cells; or, the Graafian vesicle are two membranes, which we will call the inner and outer coat of the Graafian vesicle (*Fig. 10, o. v.*) Besides this, there are a number of cells which De Graaf divided into three distinct layers or distinct membrane. In the midst of these cells is found the little ovum imbued with all the peculiarities of its parent, the human female, and destined to become a living being endowed with physical and spiritual life. Besides this structure, the Graafian follicles contain albuminous fluid of a slight yellowish color, which is coagulable by heat. In this fluid float granules and oil globules.

7. OFFICE OF THE OVARY.—The ovary is to the female what the testis is to the male. It is the germ-preparing organ, and therefore the most essential part of the genera-

tive apparatus, all the other structures being only its accessories. The ovary is not merely an organ for the formation of the ova, but is designed also for their separation and expulsion when they have reached maturity. This process is usually termed ovulation, and takes place without the assistance of the male. The ova which are formed at an early period are not called into activity until the system is sufficiently developed for the parturient act to take place without serious detriment to the system.

In some of the lower order of animals the whole of the vital energies of the parent is exhausted by one effort of reproduction. It is probable that long before the time arrives for the development of the ova, many of them have perished, their places being continually supplied with new formations. On the other hand, at the decline of life the power of reproducing and emitting ova altogether fails. Hence the limitation of the office of reproduction is allotted to that period in which the vital energies are at their fullest vigor, when the parent may transmit to the offspring a strong and vigorous constitution.

Most parents overlook the fact that all the weaknesses, peculiarities and idiosyncracies of the parent are conveyed to the germ at the time of conception, and will unfold with it and become part and parcel of the constitution of the new being. Until this is fully realized by parents and the difficulty remedied, it is but reasonable to suppose that the vital *stamina* of each subsequent generation will greatly degenerate or deviate from perfect original or normal health. There is not an observant physician living who is not able to trace distinctly the weaknesses and constitutional imperfections of the parents, and show that they are more fully developed in the offspring, when they partake of them, than in the parents themselves.

The husbandman expects when he plants imperfect seed to reap the fruits of such labor. The same is the case in raising unhealthy stock. "A corrupt tree cannot bring forth



THE VOICES OF FAIRYLAND.



A MESSENGER OF LOVE.

“The supreme happiness of life is the conviction that we are loved.”

Victor Hugo.

good fruit," neither can an unhealthy human being generate vigorous offspring. The principles of Nature are self-apparent in this regard. There can be no violation of her simple laws without entailing some evil or abnormal consequence.

From what has been already stated, it will be perceived that the ovary in the human female has three noticeable periods. The first is that of preparation, extending from birth or infancy to puberty. The second is that state of activity which extends from puberty to the decline of life; and the third period is that of decay during the decline of life.

a. The First Period.—Origin of the Graafian Vesicle.—

There has been found no trace of the Graafian vesicles before birth. The first evidence we have of their formation is soon after birth, when they consist of a little transparent vesicle surrounded by granular cells, which are filled with a clear fluid containing cell nuclei and granules. Surrounding this is observed traces of the ovasacs becoming developed, which continue until a Graafian vesicle is formed. If the ovary of an infant be examined, when it is a few months old, by dividing it longitudinally, as in Fig. 9, it will be seen that the outer surface contains a large number of Graafian vesicles and ova in various stages of development, while the central part is made up of blood-vessels and connecting tissue, which ultimately becomes similarly formed to the outer or peripheral portion.

b. The Middle Period, or Second Stage of Growth and Maturation, is the one to which the most interest is attached. During certain portions of this period or epoch the ovary is employed in ripening and emitting ova, and is a *periodic* occurrence in the human female as well as in the various orders of animals. The emission of ova will occur at different periods in different animals, these differing again from those occurring in the human female.

In the roe, for instance, Bischoff has discovered that she emits ova only once a year, which is the latter part of July

and during August; and, also, that it is only at this period of the year that the ovary of the female contain ripe ova and the testes of the male ripe semen: hence, this is the only time when the animal can become impregnated.

In many animals the ripening of the ova and discharge occur more frequently. Especially is this the case in the human female, such periodicity occurring, no doubt, once a month, or during the menstrual discharge. This will be found more fully demonstrated in the article on Menstruation.

The office of the ovary from puberty to decline of life, is to mature ova and discharge them monthly during which operation the whole energy of the ovary is called into action. After an ovum has been expelled, the wound made in the walls of the ovary becomes healed, and the action is transferred to another set of follicles, which ripen and pass through the same order of changes as before.

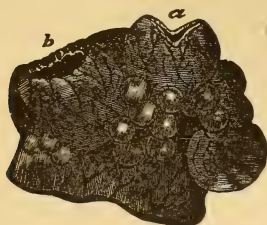
The ovary cannot be said ever to be, during this period of life, in a perfect state of rest. New ova are all the while undergoing development; hence, ova may be found in the ovary in all stages of ripening.

There are two circumstances which arrest the process of ovarian development, namely, utero-gestation or pregnancy and lactation or nursing. Occasionally exceptions may be made to this rule; nevertheless, the evidence collected favors the belief that pregnant women, and those who suckle, emit no ova during the continuance of either.

When the period approaches, or has already arrived at which the female is in a condition to propagate, and ready to receive the male, a number of Graafian follicles increase in size and approach nearer the surface of the ovary, presenting the appearance of round grains, so close set as to give the semblance of a bunch of grapes. (*Fig. 12*). When these enlarge in size it is occasioned by an increase of the fluid in the follicle, the same being supplied by the minute capillaries or blood-vessels, giving it a bright red color. While these

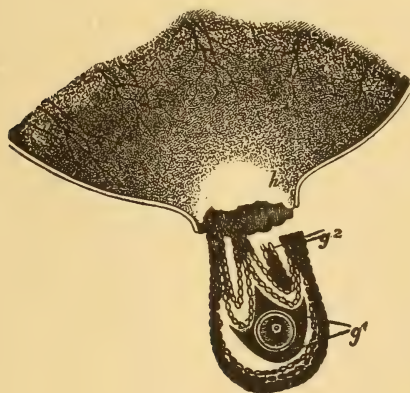
changes are going on within the follicle, preparations are being also made externally for the rupture of the walls of *the ovary*. (*Fig. 7, D. D.*, and *Fig. 12, a. b.*) The part to be thus broken becomes exceedingly red from the accumulation of blood while the membrane which encloses the Graafian

FIG. 12.



Portion of ovary of the Sow. The Graafian follicles project above the surface of the ovary. Two of them (*a, b*) have already burst and eliminated their contents.

FIG. 13.



OVUM OF THE RABBIT IN THE ACT OF ESCAPING FROM A RUPTURED GRAAFIAN FOLLICLE

The ovum is surrounded by the tunica granulosa, *g1*, and draws after it the portion of membrana granulosa termed the retinacula, *g2*; at *h*, where the rupture has taken place, the coats of the follicle are attenuated, and toward this spot numerous vessels converge.

follicle becomes thinner and thinner, by pressure and absorption, until they are finally ruptured, (*Fig. 7, H.*, and *Fig. 13*) and the ovum expelled, leaving a clot of blood and a bloody fluid.

If an examination be made of a healthy woman who has previously menstruated regularly up to the time of death, there will be found in each ovary one or more Graafian follicles in the condition just described. As the Graafian follicles repair, they come toward the outer margin or periphery as represented in (*Fig. D D, 7.*) Only one of these ripen, as a general rule, at one time. Sometimes two or three are developing and preparing for being ruptured at the same period. If the bloody fluid be washed out of the Graafian vesicle after the ovum has been expelled, its inner surface will be found intensely red, looking like an inflamed surface.

8. PERIOD OF RUPTURE OF GRAAFIAN FOLLICLE AND ESCAPE OF THE OVUM.—This period is called by Pouchet the period of parturition of the follicle. This is after the ovum has passed through its various changes of development, and is expelled from the Graafian follicle in order that it may enter the Fallopian tube. Therefore the ovary is to the ovum what the womb is to the fœtus. It nourishes it, and when it is matured, expels it into the Fallopian tube, where it passes through other changes, provided it becomes impregnated by the spermatozoa while traversing this channel.

In animals where the egg is large, it (the egg) will assist in rupturing the ovasac. In the human female the ovum is too small to effect any such purpose in order to liberate itself. It lies in the Graafian vesicle perfectly passive and uses no mechanical effort whatever for its own liberation. The process by which this takes place is compared to the bursting of an abscess, with which mode of rupture nearly every person is familiar. The accumulation of the liquid before described within the follicle causes a pressure against its walls, and this kept up for a short time, will render them so thin

by abortion, that a very slight force is sufficient to rupture the sac and expel the core and contents of the same.

As has been already stated, there are four membranes that must be ruptured before the ovum can be expelled from the Graafian follicle; namely, the two membranes forming or enclosing the contents of the Graafian follicle, and the two membranes of the ovary known as the peritoneal coat and tunica albuginea. When these four membranes are sufficiently absorbed to admit of a rupture, it takes place, and the ovum, with its *membrana granulosa* or those layers of cells before alluded to, in which the ovum is imbedded, is expelled—which expulsion is beautifully shown in *Fig. 13*.

Here is represented a ripe Graafian vesicle which has just discharged its ovum with the tunica granulosa (*g1*), and dragging after it a portion of the retinacula, (*g2*). In the human female two or more follicles may become matured or ripened at the same time, and burst simultaneously. Should this occur, and each become impregnated in the Fallopian tube, they will severally develop a new being. In this way twins and triplets are produced at the same time.

There are some remarkable features about the healing of the rupture of the membranes of the Graafian follicle, after the ovum has been expelled, as well as in the changes that take place in the follicle itself. The changes are very different if pregnancy does not occur after the ovum is expelled, from those changes which take place when impregnation is effected. In order to the comprehension of this subject in a proper manner, it will be necessary to speak first of the changes that take place in the follicle and its obliteration without pregnancy, and those which occur when fecundation follows the rupture.

a. Without Pregnancy.—Immediately after the expulsion of the ovum, the ruptured membranes gradually approximate, the redness disappears, and an exudation is thrown out, which causes the part to become agglutinated, precisely as is observed in a boil after it has discharged its contents.

When the parts become united there remain the common cicatrix observed in the healing of other tissues. While the healing is going on, the follicle itself shrinks to a very small dimension, and by the time one or more follicles have passed through the same series, which will require a month or two, the cavity of the follicle will be shrunk so as scarcely to admit of a body of the size of a small pin-head, (*Fig. 8, h*) the membrane lining the same appearing puckered. The follicles continue to decrease in size until they become entirely obliterated, giving room to other vesicles or follicles, which pass through the same stages of growth and decay. By this frequent obliteration of the follicles, which is continually taking place during the menstrual period of the female, the ovaries, in advance life, exhibit a large number of pits and furrows, (*Figs. 14 and 15*) at once affording a striking proof

FIG. 14.

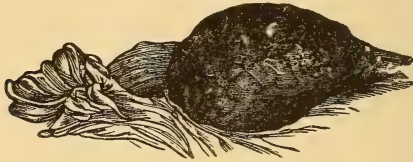
Ovary about the time of cessation of menstruation. (*Ad. Nat.*)

FIG. 15.

Ovary in old age. (*Ad. Nat.*)

that the discharge of the ova or eggs from the ovary occurs independent of sexual congress.

b. After Pregnancy.—Very different are the changes which take place in the Graafian follicles when impregnation occurs from those which appear in the absence of impreg-

nation. In both cases, it is true, there is the same obliteration of the follicle, but in the latter it is much slower than in the former case. The cicatrix will form in about the same time in each, while the obliteration of the vesicle after pregnancy may not be effected under thirteen or fourteen months. This process is also upon a very extensive scale. When impregnation has occurred, all parts of the generative apparatus are brought under the influence of a common stimulus. This is particularly the case with the uterus, which very soon receives a large supply of blood. The blood-vessels of the ovaries and uterus, together with their nerves, being so intimately associated, any stimulation of either will act similarly upon all the others. The vessels becoming loaded with blood, a greater amount of vital action takes place both in the ovary and the uterus. This is not the case when impregnation does not occur. When the ovum is thrown off from the ovary, it gradually subsides into a quiescent state, while the lacerated membranes of the vesicle and ovary unite and thus obliterate the follicle.

The stimulus consequent upon the union of the male and female germ seems to retard these changes—setting up new ones, that accomplish the same ends, although requiring a longer time for their accomplishment. In impregnation, the inner membrane of the follicle becomes thickened by a deposit of yellow oil granules. The Graafian follicle, at the time of rupture, may occupy from one-fourth to one-half of the ovary, and will continue to occupy this space until the third or fourth month of pregnancy; while if this does not occur the follicle will disappear in a month or two months. After four months of pregnancy, the follicle gradually diminishes—the inner coat rapidly increasing by a deposit of the oil globules, and this thickening encroaching upon the cavity, causing its diminution. The parts surrounding the follicle at this time become hard and swollen; likewise the ovary, which is larger than its fellow (*Fig. 16, and 44, c.*)

The deposit of thin yellow oil globules within the follicle has given rise to the supposition of the formation of a new

FIG. 16.



Section of the ovary of a woman who died at the end of the fourth month of utero-gestation. The Graafian follicle of the ovum which had been impregnated projects above the stroma. (*Ad. Nat.*)

membrane, thus leading to erroneous conclusions in regard to a *corpus luteum*, to be presently described. After the fourth or fifth month of pregnancy the follicles begin to diminish more rapidly and so continues until the time of birth, or nine months, when the ovasac will have lost much of its brightness, the cavity being nearly filled. Some four or five months after delivery, the cavity is entirely obliterated, the yellow appearance subsiding into a pale or white line, the cicatrix also disappearing meanwhile. (*Fig 44, c.*)

CORPUS LUTEUM.

The Corpus Luteum is the yellow body which is left in the ovary in consequence of the bursting of a Graafian vesicle. (*Fig. 17.*)

FIG. 17.

GRAAFIAN FOLLICLE AND CORPUS LUTEUM. (*After Von Baer.*)

Fig. 17 represents a corpus luteum taken from a female who destroyed herself by drowning, eight days after impregnation. 1, mucous tunic of the Graafian vesicle sprouting from the circumference toward the centre; 2, external tunic of the vesicle; 4, ovarian stroma; 5, ovarian membrane; point at which the ovulum escaped from the Graafian follicle.

Modern physiologists and anatomists look upon it as an obsolete term. The expression belongs to a time when anatomists were in the habit of designating by the word *body* or *corpus*, any part of the animal economy whose nature or relation with other parts was not understood. *Farre* thinks it is an unfortunate circumstance that such a term should ever have been applied to the Graafian follicle—the more so, since it was employed without any definite meaning.

The difference in the yellowness of the Graafian follicles in the impregnated and unimpregnated state, has caused the name of *corpus luteum* to be used without expressing anything more than a yellow body. The one was called a *true* and the other a *false* CORPUS LUTEUM. With the same propriety a child might be called a *false* man. The term is arbitrary and unscientific. It is calculated to mislead to the supposition that the *false* and *true* corpus luteum are really different bodies, whereas they are the same, only in different stages of growth and decay, as has been already intimated.

DOES THE DISCHARGE OF OVA TAKE PLACE WITHOUT SEXUAL CONGRESS?

Much controversy has occurred, at various times, in regard to the discharge of the ovum. All observers down to *Barry* contend that coitus was the sole cause of such phenomena, and that it could only take place during sexual congress. Late observers have exploded this idea. *Coste*, *Bischoff* and other modern physiologists, now regard coitus as having nothing to do with the discharge of ova, and clearly demonstrate that they ripen and are discharging periodically without reference to conjunction, and thrown off from the uterus. This is the case in all mammalia, including the human female. This subject will be found more fully treated in the article on *Menstruation*.

THE PERIOD OF DECLINE OF LIFE.

This period commences at the termination of the catamenia

or menstrual flow, when if the ovaries be examined they will present a wrinkled, corrugated appearance, full of pits and tortuous lines. If a section be made in the ovary, there is found no trace of Graafian follicles, or one or two may be observed disintegrated into small masses or sacs of cartilaginous hardness. Generally, however, nothing remains except the dense parenchyma or stroma which forms the interior of the ovary.

On the other hand, if the ovary be examined from puberty to the critical period of change of life, it will be found largely supplied with blood-vessels, which may be seen ramifying all its parts. After the process of ovulation has entirely ceased, the ovary begins to suffer the wasting of age, presents a general pallor, and receives only that sufficiency of blood to answer for the nutrition of the shriveled organ.

EFFECTS OF EXTIRPATING THE OVARIES.

The removal of one ovary does not effect materially the reproductive power. *Hunter*, in order to test the effects of extirpating one of them, procured two young sows of the same farrow, and removing one of the ovaries from one of them, kept both animals under the same circumstances, in order to observe the effects of breeding upon them. They commenced engendering when two years old, the spayed animal took the boar earlier than the perfect female, and both continued to breed at nearly the same time. The mutilated sow produced her litters until she was six years old, at which time she had had eight farrows and brought forth seventy pigs altogether, and would not take the male afterward. The other continued breeding until she was eight years old and had thirteen farrows, yielding one hundred and sixty-two pigs, when she ceased to breed. The result was that the perfect animal continued to breed two years longer, and produced more than double the number of the spayed one.

Mr. *Potts* removed both of these organs in the human female, in the St. Bartholomew's Hospital, on account of swelling of both groins attended with much pain. The woman was in full health, large breasted, and had menstruated regularly. These tumors proved to be the two ovaries which had descended in the form of double hernia. The woman subsequently enjoyed good health; became thinner but more muscular, while her breasts disappeared and her menstruation ceased altogether after the operation.

An interesting example of the arrest of development of the ovaries is preserved in the Museum of King's College, London. The preparation consists of the entire internal organs of a young woman who died at the age of nineteen, without having menstruated. The ovaries, as well as the rest of the organs, are no larger than a child's of three years. The mammæ are small, the external organs only partially developed, while the whole frame is formed upon a very feeble scale.

CHAPTER III.

STRUCTURE OF UNIMPREGNATED OVUM.

ITS ORIGIN AND FORMATION IN HUMAN FEMALES.

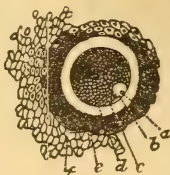
THE ovum may be described as a spheroid mass of organized substance, enclosed in a vascular membrane, and when fecundated by the sperm of the male undergoes various changes or development, until it is unfolded into an embryo. All animals with the exception of some of the lower, as the Infusoria, propagate their species and maintain them by means of the ova and sexual generation. It seems to be a law of Nature that species can only be propagated in this way. The result of fecundation is the formation of an embryo from the ovum, which by progressive growth arrives at maturity and assumes the form, structure and habits, as well as weaknesses and imperfections of its parents.

The ovum has two phases or stages of existence. The one is in connection with the female organ, which provides material for its development until it arrives at the stage of maturity, when it is expelled from its bed or Graafian vesicle. The other is the influence exerted over it when it comes in contact with the fructifying principle of the male, in which a new power is awakened and developed. The ovum, therefore, cannot be considered as having arrived at maturity (though such is the case, so far as its own structure is concerned) until it is united to the spermatozoa of the male; for without it, its progress is arrested so far as regards its ultimate development.

On examining a fully developed ovum, after it has been expelled from the Graafian follicle, its structure will be found arranged as follows (*Fig. 18*):

- 1st. Portion of membrana granulosa uniting to its walls.
- 2d. Zona pellucida, enclosing the yelk or vitellus.
- 3d. Yelk or vitellus.

FIG. 18.



OVUM.

a, germinal spot; *b*, germinal vesicle; *c*, yelk; *d*, zona pellucida; *e*, tunica granulosa of Barry; *f*, adherent granules of cells.

4th. Germinal vesicle.

5th. Germinal spot.

The zona that embraces the yelk, consists of a dense, thick, colorless albuminous membrane.

The yelk consists of granules and globules imbedded in a fluid substance contained within the yelk.

The germinal spot lies within the germinal vesicle. It consists of fine granular matter, and strongly reflects light.

The eggs of different animals vary in size. The eggs of birds increase in size in relative proportion to the size of the creature. The egg of the *Æpyorus*, an extinct bird, is very enormous. The remains of one of these, with its egg, was recently discovered in Madagascar. The circumference of this egg, in its long diameter, is said to be three feet, and its short diameter two feet four inches. It must have contained within its shell, according to *M. Isidore Geoffroy*, ten quarts, or nearly six times as much as an ostrich's egg, or one hundred and forty-eight times as much as an ordinary hen's egg, or fifty thousand times as much as a humming bird's egg. The human ovum is not more than 1-200 of an inch in diameter, and its weight about 1-2000 part of a grain. In the fowl the entire egg, when newly laid,

weighs two ounces, or nine hundred grains, and is nearly 1-22 part of the adult body, supposing it to be under three pounds; while the weight of the human ovum is about 1-1,000,000,000 part of that of the human female.

NUMBER OF OVA.—The number of ova developed in the female sex during the whole of her life, vary very much, and probably cannot be definitely ascertained.

The ovary of a herring has been found to contain twenty-five million eggs. In the ovaries of a halibut weighing one hundred and fifty pounds, three million have been counted. The African ant is said to lay eighty thousand eggs in twenty-four hours, and the common hair worm eight million in less than a day. In birds and those animals that have large eggs only a few of them arrive at maturity. In the common fowl that lays daily two-thirds of a year, a product amounting to thirty pounds, or ten times the weight of the animal, is the result, while the number of eggs produced in the course of the bird's natural existence will not be less than twelve hundred. The number of ovula in the common hen will amount to thirty or forty thousand; hence, as twelve hundred eggs are only produced on an average from each, it will be seen that a large number of ovula never arrive at maturity.

In the human female but few ova ripen or come to maturity at a time. Thus several ova may be discharged at every menstrual period for about thirty years of life. The number thus discharged can scarcely be less than four hundred (probably many more), each one of which if fully developed, by being brought in contact with the fructifying seed of the male, would be capable of bringing forth a living being. It has been stated that the human ovum is about 1-200 of an inch in diameter, or of the size of a pin's point; but small as it is, each one is capable of unfolding a human being.

It is interesting to trace the ovum and observe the changes which take place as it passes through the Fallopiian tubes. Its development in the ovary and expulsion therefrom has

already been noticed, while a description of its structure has been given, together with the manner in which the fimbriated portion of the tube has grasped the ovum. As these changes take place before the egg reaches the uterus, it will be necessary to dwell somewhat particularly upon such processes or phenomena. This part of the subject, perhaps, belongs more properly to the article on Conception or Fecundation, but the whole will be better understood by presenting every thing that necessarily has a bearing upon all such changes. The changes that take place in the ova of animals, during their passage along the tubes, will also be explained, as there is a close analogy between the functions of the reproductive organs of animals and the human female.

CHAPTER IV.

OVUM OF HUMAN FEMALE AND ANIMALS.

THE CHANGES THAT TAKE PLACE DURING THE PASSAGE OF THE OVUM ALONG THE FALLOPIAN TUBES.

THE way in which the ovum is conveyed along the passage of the Fallopian tubes after its reception in the fimbriæ of the oviduct, is explained by the peculiar structure of the parts. The tube is lined, as before stated, by delicate ciliated membrane, the movements of which cilia, according to *Henle*, is toward the uterus, which is sufficient, with the peristaltic action or contraction of its walls, to convey the ovum into the womb.

The time occupied for the passage of the ovum through the Fallopian tubes, is not definitely known; but judging from observations made on animals, the period is supposed to be from six to twelve days.

An ovum after being expelled from the ovary, is invested by a portion of the *membrana granulosa*, which formerly lined the Graafian follicle, (*Fig. 13, g, Fig. 18, e,*) and in this condition is received into the Fallopian tube. These cells are closely attached to the *zona pellucida*, or outer membrane of the ovum. They give the egg the appearance of being surrounded by rays. (*Fig. 19.*) This is characteristic of a fully developed and ripened ovum. After its passage into the tube, the great change it undergoes is the stripping off of the ray-like appendage of cells. This is effected during its transit along the upper third of the tubes (*Fig. 20.*)

If impregnation does not now occur, the ovum or egg perishes. It cannot proceed any further in its development toward the production of an embryo. If the ovum should be-



“KISS ME QUICK!”

“A house is never perfectly furnished for enjoyment unless there is a child in it three years old and a kitten six weeks old.”

Southey.



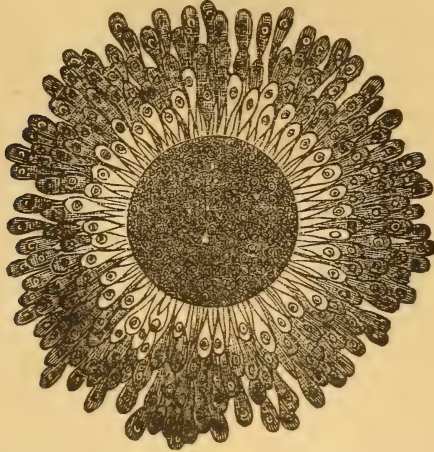
EVERING STORY

THE EVENING STORY—“AND THE BEAUTIFUL FAIRY SAVED THE GOOD LITTLE GIRL.”

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come impregnated several important changes take place, which are as follows: The zona pellucida, or outer mem-

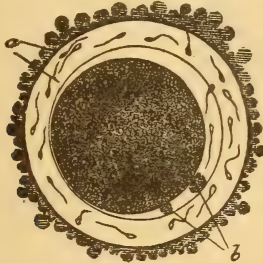
FIG. 19.



Ripe ovum from the ovary surrounded by cells which are attached to the zona pellucida. The cells are so arranged as to present the appearance of rays.

brane of the egg, having thrown off its outer cell-covering, presents the appearance as represented in (Fig. 21), which

FIG. 20.



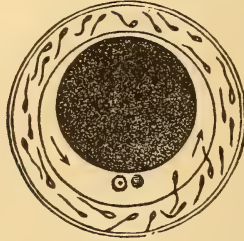
THE OVUM ON FIRST ARRIVING IN THE FALLOPIAN TUBE. THE RAY-LIKE APPENDAGES ARE NEARLY STRIPPED OFF. (After Bischoff.)

a, zona pellucida; *b*, granular bodies between the zona pellucida and yelk.

being divested of the obstruction that invests it, the spermatozoa have no difficulty in penetrating the soft albuminous

membrane that encloses the yolk. When the spermatozoa penetrate the zona, the yolk contracts. This fact was first

FIG. 21.



THE OVUM A LITTLE MORE ADVANCED IN THE TUBE. (After Bischoff.)

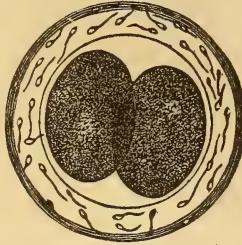
The surface is perfectly smooth. Spermatozoa have penetrated the zona pellucida. The respiratory chamber is formed between the latter and the yolk. The rotation of the yolk has commenced, as indicated by the arrows. The granular bodies appear preparatory to the segmentation of the yolk. Several of the stages are seen commencing in the preceding figure.

observed by *Newport*, who called the space the “*respiratory chamber*.” This interspace is filled with a transparent fluid. After the contraction takes place another remarkable change occurs, which is the revolving of the yolk. This rotation is indicated by the arrows of the cut, (*Fig. 21,*) and is effected by the aid of *cilia* which line the inner surface of the yolk. About this time a small body, or there may be several bodies, seen in the “*respiratory*” space between the yolk and zona which is supposed to have some connection to the cleavage of the yolk, which is about commencing.

The experiments of *Newport* settle beyond dispute, that segmentation or division of the yolk is the result of pregnancy alone, and never takes place without it. The segmentation commences first by a cleavage of the yolk into two equi-divisions, (*Fig. 22,*) then into four equal parts, (*Fig. 23,*) and so continue dividing in geometrical progression until the yolk is broken up in fine granular masses, with which the generative force of the male sperm is equally divided. How the yolk divisions take place before the ovum reaches the uterus is not certainly known. The fifth division, how-

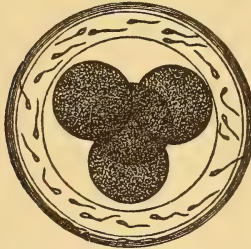
ever, has been observed by *Bischoff* at the lower extremity of the Fallopian tubes similar to what is exhibited in (*Figs 24 and 25*).

FIG. 22.



THE OVUM STILL MORE ADVANCED IN THE TUBE.

FIG. 23.



THE OVUM FROM THE LOWER OR UTERINE END OF THE FALLOPIAN TUBE.

FIG. 24.



THE ADDITION OF A LAYER OF ALBUMEN IN THE LOWER PORTION OF THE TUBE.
(OBSERVED ONLY IN THE RABBIT.)

The only additional change observed taking place in the tubes is a deposit of albumen around the zona pellucida, (*Fig.*

FIG. 25.



OVUM OF THE RABBIT FROM THE FALLOPIAN TUBE WITH SPERMATOZOA.

The accompanying figure is introduced to show the usual position of the spermatozoa in relation to the zona and albuminous layer in the ovum of *Mammalia* during and after impregnation. This ovum is magnified two hundred and fifty diameters. It was taken along with five others from the lower part of the Fallopian tube, sixty-eight or seventy hours after impregnation. The segmentation appears to have proceeded to the fifth stage. There is a thick covering of albumen over the zona, and a number of spermatozoa are represented involved in the albuminous substance; some were also seen on the surface of the zona, and some varying in number in the different ova observed from five to seven or nine, were clearly ascertained to be situated within the zona on the surface of and in the grooves between the yolk segments. The position of these last is not sufficiently clearly represented in the figure.

24) which takes place when the ovum is passing the middle and lower third of the tube. These occurrences are so uniform that the different offices for different portions of the Fallopian tubes may be readily determined.

The first or upper third is appropriated to the reception of the ovum, and for removing the adventitious covering of cells, while it also prepares the ovum for the operation of the

spermatozoa. In the middle third, the respiratory chamber is formed, and here the rotation of the yelk commences. In the lower third the cleavage takes place, as also the deposit of albumen.

If these views of *Bischoff* be correct, it must be in the middle or lower third of the tube that impregnation occurs, or the ovum will perish. By the time the ovum reaches the lower third, in most animals, particularly the dog and guinea-pig, the *heat* is passed, and the animal will not permit coitus.

To sum up the offices of the Fallopian tubes, they may be stated as follows:—

1st. To receive the spermatic fluid from the uterus, and convey it upward through the entire canal.

2d. To receive the unimpregnated ovum from the ovary, and convey it in a directly opposite course for the purpose of meeting the male sperm.

3d. To afford protection to the ovum during its brief pilgrimage through the tube, and to deposit on its outer surface additional material, increase its bulk, and finally convey it into the cavity of the uterus.

The next question which arises in connection with this subject is—How far are these conclusions applicable to the human female in regard to gestation?

In the human female, that marked indication of sexual excitement known as *heat* in animals is rarely ever manifested, although it exists to some degree at each menstrual period. It is well known that the liability to impregnation is much greater immediately after the cessation of the menstrual flow than a little later during the intervals of the monthly turn. Observation would seem to strengthen the view which has been advanced, that impregnation occurs, as a rule, within twelve or fourteen days after the cessation of the menstrual discharge. It has also been known to occur after this period, but very seldom. This may be explained by the casting of an ovum during an intermenstrual period which was

nearly ripe at the cessation of the previous discharge; while it is quite possible, also, that an ovum may be retained in the tube longer than the period named, owing to some retarded action of the regular functions of the co-relative parts. It may, however, be safely stated, as a general rule, that impregnation takes place within fourteen days after the cessation of the catamenial period. There are exceptional cases, as a matter of course, to every law.

CHAPTER V.

DEVELOPMENT.

DEVELOPMENT OF OVA IN BIRDS AND OTHER OVIPAROUS ANIMALS.

THE difference in the amount of formative material in the ovum of the bird is owing to the manner in which the embryo is supplied with its sustenance. Here the whole amount of nourishment required, is provided in the egg before it is detached from the parent. In the human female and animals that bring forth their young alive, the material for growth is derived from the maternal parent, whether afforded by the placenta or some analogous structure.

The egg of the ordinary domestic fowl may be regarded as the type of oviparous animals. A knowledge of its development will enable any one to comprehend the difference which exists between the eggs of the human female and viviparous animals, or those that develop with the egg the necessary material for growth independent of the parent. In such cases, normal temperament and a supply of oxygen are all that is necessary for development of the young, provided the egg has been fecundated before being thrown off by the female. A varnished egg will not hatch, nor can this take place if one-half of the shell be thus treated.

The average size of a fowl's egg is two and a quarter inches in diameter long and one and three-quarters in the short diameter, the average weight being two ounces. Double-yelked eggs usually weigh about three ounces. The weight of the yelk is about one-third of the whole, while that of the albumen and shell are equal to the other two-thirds. If eggs are kept exposed they become lighter, losing about one grain per day, which is owing to evaporation through the shell, it being of a porous nature. During incubation or

hatching of the eggs they lose rapidly, amounting in twenty-one days from sixteen to twenty per cent, or about one-sixth of the entire substance. Out of this amount of loss only five or six per cent. consist of water, the balance is the result of chemical decomposition, or most probably of combustion, by the union of oxygen with carbon, producing carbonic acid, which passes off through the shell. The shell of the egg consists principally of carbonate of lime, held together by animal matter, while the white is chiefly pure albumen. The yolk is of oily matter, albumen, and about two per cent of salts, with fifty-four per cent of water. The albumen with the sulphur and salts are immediately employed in the growth of the embryo, while the oily matter serves for combustion in keeping up the temperature during incubation. If an egg be examined immediately after being laid, there will be found directly under the shell at the larger end, a small space, called the air space, which increases the longer the egg is kept. This space also increases very rapidly during incubation being caused by the evaporation of water and chemical decomposition, as before stated.

STRUCTURE OF THE EGG—PROCESS OF FORMATION.

Many fowls lay an egg every twenty-four hours during a portion of the season, while others lay every second day, or for two or three days in succession, at a later hour each day, and then intermit for one day. Other fowls lay regularly every thirty-six hours. As already intimated, the time occupied in the passage of the egg through the oviduct in the dog, guinea-pig, rabbit, and human female is from six to twelve days. In a fowl this transit is about twenty-four hours. If a fowl that has laid daily, be killed six hours after the last egg is passed, the oviduct will be found blocked up with a yolk that has been taken up by the fimbriated extremity of the tube, or it may be just grasping it, as is seen in (*Fig. 26, b.*) Sometimes the fimbriated extremity of the tube unfortunately fails to enclose the yolk when expelled from

FIG. 26.



OVARY AND OVADUCT OF A LAYING FOWL, KILLED TWELVE HOURS AFTER LAYING THE
LAST EGG.

a, Left ovary; *b*, opening of the infundibulum of the oviduct and grasping an ovum about being expelled from the ovasac; *c d*, glandular portion of the oviduct; *d*, the isthmus; *e*, an egg in the uterine portion of the oviduct, in which the shell is begun to be deposited; *f*, the rectum, ending in the cloaca; *g*, the undeveloped right oviduct occasionally met with in birds.

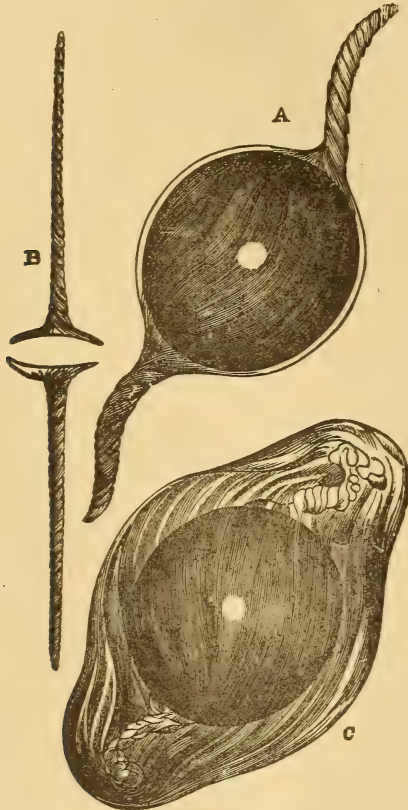
the ovary. In such cases it falls into the abdomen and may be removed by absorption, or it may produce peritoneal inflammation and death to the fowl.

During the passage through the upper or first two-thirds of the oviduct, the albumen of the egg is deposited in a period of from three to four hours, according to *Coste*. It is proper here to remark that the yolk of the egg when it is expelled from the ovary, is the same in structure as that of the rabbit and human female, before described; and that it is during the passage of the egg through the tube, that the white and shell of the egg is formed, but it is not entirely perfected until after its lodgment in the uterus. (*Fig 26, e.*)

White of the Egg.—This constitutes several layers, and commences forming as soon as it enters the Fallopian tube. At first it is a thin layer immediately investing the yolk, which subsequently becomes condensed into the chalaziferous membrane and the two narrow cord-like appendages, which were first albumen but afterward become twisted and form the chalazæ. (*Fig. 27, A.*) As the yolk descends, the faster is the accumulation of the albumen round the yolk and chalazæ, giving to the egg its oval shape. (*Fig. 27, C.*) During the passage of the egg and formation of the albumen and shell, there is a great determination of blood to the several parts of the duct. The egg does not descend in a straight line, but in a spiral manner, (*Fig. 27, D*) which gives the spiral shape to the white of the egg and the twist to the chalazæ. The egg remains in the uterus from twelve to eighteen hours, in order to complete the formation of the shell. The lining membrane of the uterus is different from the membrane lining the oviduct—the former containing follicular glands which secrete the substance for the shell. As soon as the egg enters this part of the tube, a thick white fluid is poured out which is soon deposited and coagulated on a thin membrane covering the white. At first the shell

is soft, but it soon acquires the hardness which is characteristic of the egg when laid.

FIG. 27.



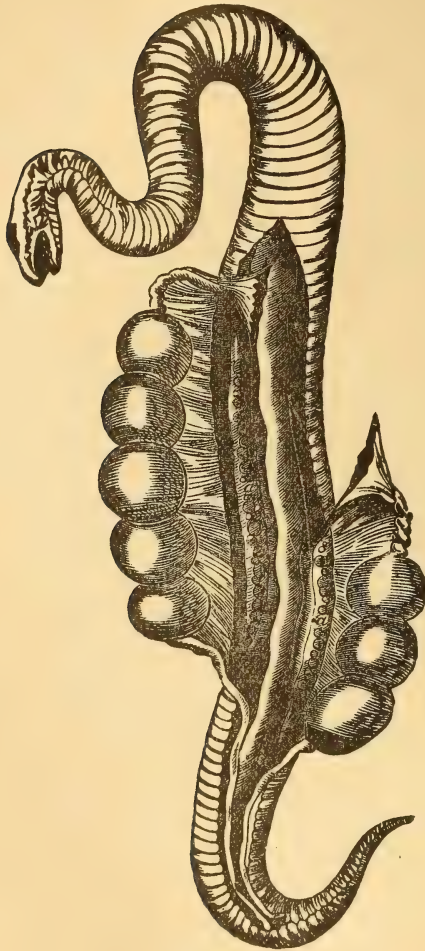
MANNER IN WHICH THE CHALAZÆ, ALBUMEN, ETC., ARE DEPOSITED ROUND THE OVARIAN OVUM OF THE FOWL.

A. Yolk from the upper part of the oviduct soon after it has entered it, showing a thin covering of albumen on the yolk, forming the chalaziferous membrane, and the twisted chalazæ extending from the opposite poles of the yolk. The twisting in these is represented more strongly than it can be seen at this period.

B. Sketch of the fully formed chalazæ from opposite sides of the yolk, stretched to their full length, and showing the opposite direction of the spiral in each.

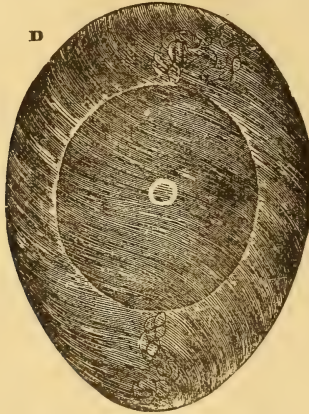
C. Egg from above the middle of the oviduct; the first layers of albumen deposited round the yolk and chalazæ.

FIG. 28.



Common adder, in which the ova have descended to occupy both oviducts, five in the right, and three in the left; the infundibulum is shown in each oviduct; *a a*, the right and left ovaries, each forming a sac, opening anteriorly near the infundibulum for the discharge of the ova, which, when ripe, fall into the interior of the sac, and thence pass into the oviduct.

In reptiles a similar arrangement is observed during the passage of the ova along the Fallopian tube. Instead of one,



D. Egg from the lower part of the glandular oviduct near the isthmus, when the deposit of albumen is complete; the spiral arrangement of the albumen made manifest by slight coagulation.

there are several in the tube at the same time, as seen in (*Fig. 28*); the same with rabbits, as seen in (*Fig. 29, A*).

CHAPTER VI.

MALE ORGANS OF GENERATION.

THE HUMAN TESTES.

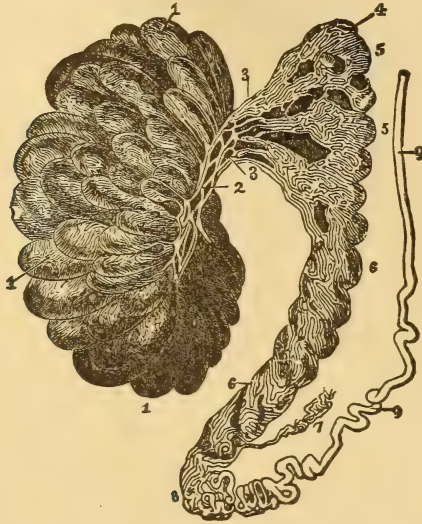
THE testicles are two glandular bodies that are suspended by the spermatic cord and scrotum. The size of the glands depends upon the age and sexual indulgence of the individual.

The scrotum consists of a simple integument, covered with hair. Within this there are four tunics or membranes, which, by comparison, may be compared to the peelings of an onion. The internal structure consists of tubes that are so convoluted or twisted upon themselves as to constitute lobes. As a description of these membranes would not be interesting to the general reader, it will only be requisite to present some idea of the glandular structure, or of that part which secretes the spermatic fluid.

As before remarked, the secreting structure of the testicles consists of tubes which form lobes. (*Fig. 30, 1, 1, and Fig. 31, 2, 2.*) If these lobes be examined carefully they will be found to consist of minute tubes, called *Tubuli Seminiferi*. Each tube is about seventeen feet long and 1-170 of an inch in diameter. The tubuli of each lobe coalesce into twenty or thirty straight tubes, called *vasa recta* (*Fig. 31, 3.*) The *vasa recta* are twice the diameter of the seminiferous tubes, and penetrate a fold of the tunica albuginea (the immediate investment of the testicle), which forms what is called the *corpus highmorianum*. In this corpus or body, an anastomosis of the tubes takes place, which is called the *rete testis* (*Fig. 30, 2.*) The *rete testis* gives off from twelve to twenty ducts or tubes, which again penetrate the corpus highmorianum in passing out, and form the *vasa efferentia*, (*Fig. 31, 5.*) Here the tubing again form into cones or lobes,

called *conus vasculosus*, which correspond in number to the vasa efferentia that form them, and afterward terminate in a common tube, (*Fig. 31, 6.*) This tube becomes again con-

FIG. 30.



TESTIS INJECTED WITH MERCURY, AND DEPRIVED OF THE TUNICA ALBUGINEA.

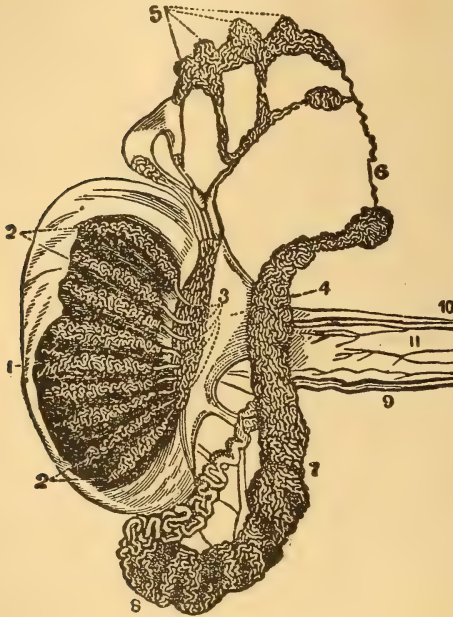
Testis injected and divested of the tunica albuginea; 1, 1, lobules formed by the tubuli seminiferi; 2, rete testis; 3, 4, coni vasculosi, formed by the seminiferous tubes; 5, 6, the epididymis; 7, appendix of the epididymis; 8, termination of the epididymis in the vas deferens; 9, 9, vas deferens.

volute or twisted and forms the *epididymis*, (*Fig. 30, 5, 6,* and *Fig. 31, 7.*) The epididymis terminates at its lower margin in a common tube, called the *vas deferens*, (*Fig. 30, 9, 9,* and *Fig. 31, 9.*) The vas deferens is tortuous when it leaves the epididymis, but becomes straight as it passes up and forms a part of the spermatic cord. It finally leaves the cord and passes up laterally on the posterior part of the bladder. It then passes forward to meet its fellow from the opposite side, when the two unite, and by their junction form a duct about one inch in length, which terminate in the *urethra* of the male penis. This duct is called the *ductus ejaculatorius*. The vas

deferens is much larger than the other parts of the tube, and is about the eighth of an inch in diameter.

The structure of the testicles will compare with that of the

FIG. 31.



THE STRUCTURE OF THE TESTICLE INJECTED WITH MERCURY, AND ITS SEVERAL PARTS UNRAVELLED. (After Sir A. Cooper.)

1, 2, 3, Tubuli seminiferi; 3, vasa recta, forming the rete testis; 4, corpus highmorianum; 5, vasa efferentia, forming the coni vasculosi; 6, a single tube formed by the junction of the vasa efferentia. This tube then becomes convoluted upon itself to form the epididymis; 7, 8, beginning of the vas deferens; 9, the vas deferens becoming a straight, isolated tube in its ascent to the abdominal ring; 10, spermatic artery; 11, spermatic cord spread out.

ovary and Fallopian tubes, as respects their peculiar beauty and arrangements. It has been estimated that there are eight hundred and forty tubuli in the two testicles, twisted in such a manner as to make each tube seventeen feet in length as before stated. This will give 14,280 feet of tubing. This is lined by a delicate membrane, which secretes or forms



EARLY MORNING.

“The rosy morn did there disclose
Her beauty, ruddy as a blushing bride.”



MADONNA AND CHILD.

granular cells—each granular cell, when developed, will form hundreds of spermatozoa, capable of unfolding a human being, when united to the ovum of a female. Truly, great and marvelous are the works of Nature thus to develop the human being out of such tiny microscopic atoms! A careful study of this wonderful structure will show the importance of very small particles of matter, in the hands of the All-wise Creator, able to endow them with vitality and unfold from them strong and powerful physical and mental organic structure.

CHAPTER VII.

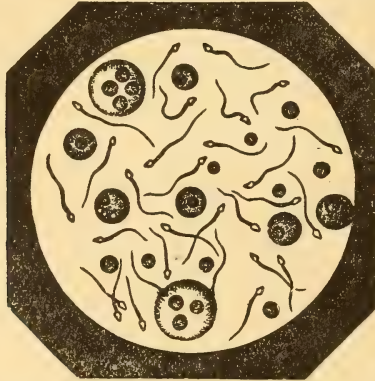
FUNCTIONS OF THE HUMAN TESTICLES.

THE office or function of the testicles is to secrete the male sperm, a substance that appears to the naked eye like ordinary mucus devoid of life. If the microscope, however, be applied to a small quantity of this secretion, taken from a healthy male who has arrived at puberty, it will be found alive with minute, thread-like, bodies. So numerous are these that, at first sight, the semi-liquid mass seems to be almost entirely made up of them. They are called the *seminal animalcules*, or *spermatozoa*. There are also found in this *liquor seminis*, minute round corpuscles called *seminal cells*.

ORIGIN OF SPERMATOZOA.

SPERMATOZOA in man, as well as in animals, and some of the higher order of plants, have their origin in cells, which are dominated seminal cells or *spermatophori*. These cells

FIG. 32.



MICROSCOPIC APPEARANCE OF HEALTHY HUMAN SEMEN MAGNIFIED FIVE HUNDRED DIAMETERS.

are filled with granular matter, (*Fig. 32*) each granule capable of being developed into a *spermatozoon*. These germ cells are developed in the tube composing the testicles. It is within the tubes these cells burst, when the thread-like bodies escape, and take on those peculiar motions which have given

FIG. 33.



Spermatozoon from the Human Testicle.

rise to the opinion that they are *distinct animalcules*. Some physiologists do not regard them as possessing distinct animal characteristics any more than is attached to the *cilia* that line the cells of the neck of the uterus and Fallopian tubes. Hence they have been called cell-germs, furnished with peculiar moving power. On the other hand, *Pouchet* asserts that these *zoospermata* have a *digestive* apparatus, which is called by him *cephalo-thorax*, as represented (*Fig. 33*; also *Fig. 34,g.*) The (*Fig. 34*) gives the spermatozoa of different animals, and the motion will correspond with the development. Those with tail-like appendages resemble the motion of an eel in water. Those with the spiral development have the spiral motion. From observation it has been ascertained that spermatozoa will retain their moving powers twenty-four or thirty hours after they enter the uterus and Fallopian tubes.

In the young and vigorous, the spermatozoa are abundant and active. In debilitated persons, those that have weak constitutions and where the vital forces are depressed, the spermatozoa will not only be found very scanty but exceedingly feeble. Such scantiness and feebleness will correspond with the vital energy or debility of the individual in whom they are developed.

In consumptives, and those who have broken down their constitution by over sexual indulgence and onanism, the action of the spermatozoa is slow and their development imperfect. In aged persons they disappear, while the testicles, like the ovaries of aged females, cease to perform the func-

FIG. 34.



VARIOUS FORMS OF SPERMATOZOA.

A. Spermatozoa from the dog; B, from the common mouse; and C, green woodpecker—after *Wagner* D. Spermatozoa from the common water snake; E, second form of spermatic animalcules from the same animal; F, bodies contained in the semen of the crab—after *Seibold* G. Spermatozoon of the bear—after *Valentine* 1, anterior margin excavated; 2 and 3, two very dark circular spots, regarded by Valentine as the mouth and arms; 4, a number of circles, supposed by Valentine to be outlines of gastric vesicles of an hepatic organ on the convolutions of an intestinal canal; 5, the same animalcule, less highly magnified and viewed laterally.

tions allotted to them in the prime and vigor of life.

The *natural* secretion of the vagina and uterus of the female is favorable for the maintenance of spermatozoa. When these become changed to acid secretions, they act as *poisons* and quickly destroy the spermatozoa. Hence, one of the causes of sterility in the female is owing to the change in the secretions of the os, cervix uteri and vagina.

The spermatozoa in man are exceedingly small—being about 1-50 of an inch in length, and 1-500 of an inch in diameter. The seminal animalculæ are said to be no larger in the whale than in the mouse. They are much larger in insects, mollusca, and others of the lower animals than in man. They are considerably larger in the mouse than in the horse, and in the snail fifty-four times larger than in the dog.

The office of the spermatozoa, as before stated, is to impart new life to the female ovum. This takes place in the Fallopian tubes during the passage of the ovum toward the uterus. The quantity of semen eliminated at one coitus is from one to three drachms, of which, perhaps, only about one-hundredth part consists of spermatozoa.

It is generally conceded that but two or three drops of semen proper, or spermatozoa, are ejected from the testicles at one conjunction of the sexes. The balance is an albuminous fluid secreted by the vesicula seminalis and prostate gland, which secretions are thrown off at the same time as that from the testicles. The use of this superabundant fluid is for the purpose of protecting these thread-like animalculæ and assist their movements. It possesses the right density or specific gravity for this purpose. If the density be increased the movement of the spermatozoa will be impeded; if reduced, they are destroyed upon the principle of endosmose.

I have in several instances placed a drop of semen from the vas deferens under the microscope, which semen is usually very thick, and always found that the motion of the spermatozoa was exceedingly slow. They presented the appear-

ance of a tangled mass of thread-like objects unable to extricate themselves. The moment, however, a drop of blood was applied, they found no difficulty in disentangling themselves. They would turn around once or twice and lash their tails, which seemed to unite the two liquids, and put the whole mass of animalculæ in motion.

The cause of motion of spermatozoa is not certainly known, but it is supposed to be similar to the wave-like motion in the ciliated cells of the uterus and Fallopian tubes.

In cold-blooded animals, the fishes for instance, they retain their power of motion longer than in warm-blooded animals. In the former they continue to move for days after being expelled from the male. Their movements continue for a longer period in the interior of the female organs of generation. In some species of insects (as the *Gasteropoda*), the spermatozoa will continue their movements for months when brought in contact with the female organs of generation.

In the human female it is supposed that the spermatozoa will retain their moving power for thirty-six hours after coitus. Common water at low temperature rapidly arrests their movements, while dilute saline solutions, or sugar and water, on the other hand, appear to have very little influence upon their actions. Such is also the fact with common saliva, or bile, or pus. Urine has rather an injurious influence upon their movements, especially when it has an acid reaction. The chemical agents are the only ones that have positive injurious effects upon the movements of spermatozoa. They not only stop their operations, but dissolve their structure and change their composition. For instance, alcohol, acids, metallic salts, narcotics and strychnine have similar effects to common cold water.

Heat and cold seem to affect their movements, although the action of the spermatozoa of frogs and fishes continue after the media in which they are surrounded sink below

zero. The electric spark destroys the motion of spermatozoa instantly, by changing their structure, while Galvanism has no perceptible influence upon them, which fact is somewhat remarkable. I have made a number of experiments with chemical re-agents, under the microscope, and always found that mineral and vegetable acids dissolve spermatozoa instantaneously as electricity. The same is the fact with mineral and vegetable astringents. The *Figs. 36, 37, 38*, give the appearance of spermatozoa under the microscope when these re-agents are applied, and show the contrast between healthy and diseased spermatozoa.



Fig. 36. Appearance under the microscope of semen after the application of vegetable acids. The spermatozoa are broken up into granules.

Fig. 37. Appearance presented under the microscope after the application of mineral and vegetable astringents.

Fig. 38. Appearance of spermatozoa under the microscope in those who have over-indulged and masturbated to great excess—such undeveloped spermatozoa cannot propagate. If conception should take place under such circumstances, the offspring will have a weak and delicate constitution and be short-lived.

On the first discovery of the seminal animalculæ, there were many hypotheses advanced concerning them. By some they were considered the cause of sexual enjoyments or venereal propensities. Others supposed that the spermatozoa were of different sexes, and believed that if a female spermatozoon happened first to penetrate the ovum a female offspring was the result, and the reverse when a male spermatozoon succeeded in fecundating the egg. Another class imagined that a spermatazoon possessed all the organs of a human being in a compressed state, which became developed or unfolded by the female generative organs—in other words, that a spermatozoon was a miniature human being.

Such absurd theories require no refutation. They were advanced in a hypothetical age of the world.

CHAPTER VIII.

HERMAPHRODISM.

THERE are two distinct varieties of Hermaphroditic malformation—the *spurious* and the *true*.

The spurious comprehends such as have the generative organs approximating the natural organs in appearance and form. The true hermaphroditism includes an actual mixture or blending of the male and female organs upon the same individual.

I. SPURIOUS HERMAPHRODISM.

In the Female. Errors have occurred in regard to the true sex of an individual, from enlargement of the clitoris and prolapsus of the uterus—the former being taken for the penis and the latter for the testicles.

In some females at birth the clitoris is not much behind that of the male penis in size at the same period of life. After this period it ceases to grow as rapidly as the other external genital organs, and at puberty it is from half to an inch in length, as a general rule. In other cases, the clitoris continues developing up to adult life, and resembles the penis of the male.

Large-sized clitores are less common among the inhabitants of temperate and cold climates than in the tropics. The frequency of them in Arabia and Egypt led the ancient surgeons of those countries to amputate the organ. *Ætius* and *Paulus Eginetus* speak of this amputation having been practiced among the Egyptians. According to *Jonnini*, circumcision is still performed upon females of that country.

This variety of conformation of the female parts was well-known to the ancient Greeks, as a number of their writers

mention such women under the name of *Tribades*, and *Etairiotriai*, among which class the celebrated *Sappho* is known to have been included. *Martial*, *Tertullian*, and other Roman writers have noticed the same malformation, and spoken of the depravity to which it led.

The clitoris is not unfrequently found two or three inches in length. In some instances it has been found from ten to twelve inches. *Chobert* mentions one case where the clitoris was twelve inches in length, and *Haller* two cases where it was seven inches long.

The clitoris of some of the lower orders of animals resembles very much the penis of the male of the same class of creatures. A very striking analogy is observed in this regard, in the lioness, raccoon, bear, cat, etc.

In the human female when the organ is large, it not only resembles the penis of the male in size, but there is an indentation corresponding to the orifice of the urethra. In other cases, the vagina is much contracted or nearly closed by a strong muscular membrane or hymen, giving the appearance of the perinæum of the male. The labia also unite and present the semblance of testicles. In such females the mammæ are but slightly developed; the voice is deep-toned; the chin and upper lip are sometimes covered with hair, while the features and muscles are hard, resembling those of the male. In short, the whole external peculiarities partake more of the characteristics of the male than of the female.

Dr. Ramsbothem has given a description of an infant that was christened as a boy, which proved after death to be a female (*Fig. 39*). The uterus and Fallopian tubes were apparently naturally developed, while the clitoris was large and resembled the male penis.

Colombos and *De Graaf* give two similar examples in children, where the true sex was not discovered until after death.

Arnaud gives a description of Galloy, the celebrated hermaphrodite, whose clitoris after death was found to be three and a half inches long and four lines (one-third of an inch)

FIG. 39.



APPEARANCE OF A FEMALE'S EXTERNAL ORGANS OF GENERATION, WHICH WERE SUPPOSED TO BE THOSE OF A MALE UNTIL AFTER DEATH. (*From Cyclo. Anat. et Phys.*)

c, c, c, Fallopian tubes and Uterus; *b*, clitoris; *a*, gland of clitoris.

in circumference. The glans and prepuce were well developed, while the urethra ran through the whole length of the penis. The external and internal female organs were naturally developed. She was married, but never became pregnant; her menstruation was natural, but she had hair on her face, while her voice was harsh like that of a male.

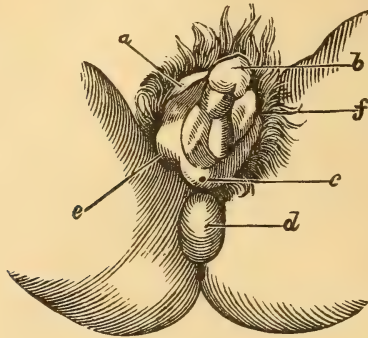
While a student, I had an opportunity of witnessing a female who had a clitoris three inches in length, which resembled the male penis in structure, except that the urethra was absent. At the orifice of the glans there was a depression which would be readily taken for the opening of the urethra unless closely examined. Her general appearance was masculine. Her history was not well known, and therefore I am unable to give her habits of life. There was no appearance that she had ever borne children.

M. Beclard has given an interesting description of a case in the *Bulletins de la Faculte* of Paris, for 1815. This case was exhibited in 1814 in Paris, and was at that time aged sixteen years. Her name was Marie Madeline Laforte. The form of her shoulders, pelvis and chest was masculine; the tone of the voice was like that of the male. Her beard commenced growing on her chin, upper lip, and along the side of the face. The symphysis pubis was elongated, as in a man, and the mons veneris rounded, while the labia externa were covered with hair. The clitoris was ten and a half inches long when at rest, but somewhat larger when distended. There was no urethra, but the head of the glans was covered with an imperfect prepuce. The labia were narrow and short, and the vulva between them was narrow, and blocked up by a dense membrane. Below the clitoris there was an opening which was capable of admitting an ordinary sound. Through this aperture both the urinal and menstrual fluids escaped. She had menstruated since she was eight years of age. She regarded herself as a female, and preferred the society of men. There was no appearance of testicles, while regular menstruation left no doubt of her sex.

Arnaud has also described an interesting case at great length. The subject was aged thirty-five, and passed in society as a female. She came to Arnaud complaining of a small tumor in the right groin (*Fig. 40, e,*) which had incumbered her much during life. On examination, he found a similar tumor on the left side. These bags represented the external labia. The clitoris was nearly three inches in length. The glans was well-formed and presented a small depression which ran backward along the whole under border of the clitoris, indicating the situation of a collapsed urethral canal. The orifice from which the urine escaped was in the same position as in a female when the organs are natural. There was no vagina, and the menstrual discharge took place from the anus. At each menstrual period, the

tumor (*d*) gradually increased, becoming in the course of two or three days of a size of a hen's egg. When the tumor reached this size, the discharge of blood commenced from the

Fig. 40.



EXTERNAL APPEARANCE OF THE ORGANS OF GENERATION OF A FEMALE.

a, clitoris; *b*, glands of clitoris; *c*, orifice for passage of urine; *d*, tumor in perinæum; *e*, small tumor in right groin; *f*, small tumor in left groin.

anus. As alarming symptoms had always occurred at these periods, Arnaud was induced to puncture the tumor, in which he found a cavity two inches in circumference and about two and a half in breadth, having a projection at one point which he supposed to be the *os uteri*. At the next menstrual period, the discharge came from the opening in this tumor, and was not attended with any of the alarming symptoms that had previously occurred. This opening, after a time, through neglect, was allowed to close, when the discharge flowed from the anus, as usual, with all the former alarming symptoms. This female's skin was thick and rough; she had a soft black beard; her chest was narrow; her breast small, like the male; her hands large and her fingers long. Her voice was coarse, the upper part of her body was masculine, while the lower part partook of the female characteristics—large pelvis, buttocks, legs, etc., with small feet. The regular menstruation of this person left no doubt

in regard to her sex. The tumors surrounding the clitoris in the groin must have been the ovaries, which had descended.

The same malformations have been found to exist in the lower animals. *Rudolphi* noticed a mare that had a clitoris so large as almost to close up the entrance to the vagina. *Lecoq* has also mentioned a case of a calf of a similar character, while *Mery* speaks of a monkey which had a clitoris so large that his keeper thought the animal was a male.

M. Veary, physician at Toulouse, has given in the "Philosophical Transactions" of London, Vol. xvi., p. 282, an account of the case of Margarete Malause or Malaure, who entered as a patient in the Toulouse hospital in 1686. Her trunk and face presented the appearance of a female, but in the situation of the vulva, there was a body eight inches in length that resembled a well-formed male penis, except that it had no prepuce, though a canal perforated the organ through which the urine and menstrual fluid was voided. After being examined by several physicians, all of whom pronounced her sexual characteristics more those of a male than a female, the authorities ordered her name to be changed to that of Arnaud and to wear male attire.

In 1693, she visited Paris in male dress and boasted that she was endowed with the powers of both sexes. The Parisian physicians agreed with those of Toulouse in respect to her sex, until *M. Saviard* detected the supposed penis to be a prolapsus of the uterus, and he reduced the protruded organ and cured the patient. The king afterward, at her own request, allowed her to assume her female name and dress.

Sir E. Horne and *Valentini*, both mention analogous cases of *False Hermaphrodisism*. Numerous other instances of a similar character are on record, which will not require to be noticed at the present time. It may be observed, however, that there are on record also equally remarkable cases of spurious Hermaphrodisism in the male as in the female sex,

which have given rise to many curious mistakes and incidents, from the time that *Iphis*, daughter of *Ligdus*, king of Crete, was supposed to be changed into a man by the miraculous power of Isis, down to the present day. *Pliny*, *Trallian* and *Livy*, all have detailed interesting cases of this description of Hermaphroditism.

The case of Magdelain Mugnoz, a nun of the order of St. Dominique, in the town of Ubeda, mentioned by *Jean Croke*, is somewhat extraordinary. It was supposed that she was changed into a male seven years after having taken the vow, when, in consequence of exhibiting strong sexual desire, and being accused of the perpetration of a rape upon a nun, she came under ecclesiastical displeasure and was expelled from the convent, after which he assumed male attire and changed his name to Francois.

A number of similar instances are mentioned by *Pare* and *Tulpius*, where malformed males were unexpectedly discovered at puberty, owing to excitement of the sexual passions.

Schweikard mentions the case of a person baptized and brought up as a female whose true sex was not discovered until she was forty-nine years of age, when he requested permission to marry a young woman who had become pregnant by him. On examination, the penis was slender, and not over two inches long, while the testicles had not descended out of the abdomen and the urethra opened at the root of the penis.

Otto has reported a remarkable case of a person who had lived for ten years in a state of wedlock with three different men. At the age of thirty-five her third husband brought an action of divorce against her, alleging that she was afflicted with some sexual infirmity, which rendered the connubial act on his part extremely difficult and painful. On examination being made by two physicians, they decided that she was not a female but a male. The members of the Royal Medical

College of Silesia subsequently confirmed this decision. The penis was imperforated and about two inches in length. There was a perineal fissure forming a false vagina, that was sufficient to receive the penis of the husband for an inch and a half in depth. The general conformation of this individual was strong and muscular, although the beard was thin and soft. The face, mammæ, chest, pelvis and extremities were masculine.

The case of Maria Nuzia given by *Julien* and *Soules* is one that may be classified with the preceding. This individual was born in Corsica in 1695, was married twice as a female, and divorced by her second husband in 1739, after sixteen years of wedlock. Her person was masculine; she had beard, but her breasts were tolerably developed, although the nipple of each was surrounded with hair, while she menstruated regularly.

The celebrated case of Hannah Wild, detailed by Dr. *Sampson*, is another example equally curious with the foregoing. She had the male genital organs malformed, while her menstrual discharges were very regular.

B. TRUE HERMAPHRODISM.—True Hermaphrodisism is found to exist naturally in several classes of the animal and vegetable kingdoms.

Those plants that are included under the term *phanerogamic*, except the class *Diœcia*, are furnished with male and female reproductive organs, which are either placed upon the same flower or on different flowers on the same plant.

In the animal kingdom, among the Entozoa, Mollusca and Gasperopoda, and some other species the fecundation of the female is accomplished by its own male organ. As we ascend in the scale of animal organization, this bisexual development ceases, except in certain peculiar cases, which will be enumerated. It is not proposed to give any minute history of true Hermaphrodisism, but merely some interesting and curious cases that have come under the notice of physicians

at different periods of the world, with a view to remove the skepticism which is now generally prevalent about the existence of any species of Hermaphroditism. The authorities here presented will leave no room for doubt on this subject.

In 1754 a young person died in the Hotel Dieu of Paris, in whom, on dissection, the reproductive organs were found to be malformed in the following manner: On the right side there was a testicle and vas deferens, terminating in a corresponding vesicula seminalis. On the left side there was found, in the place of a testicle, an ovary, a Fallopian tube with its fimbriated extremity, a small oval uterus, and broad and round ligaments. The external organs resembled those of the male, although the penis was only about two inches in length. The mammæ were large, and the individual had always been regarded as a male. Here was a case of lateral Hermaphroditism, similar to what may be found, though not so perfectly developed, in the vegetable and lower forms of the animal kingdoms.

Another celebrated case of lateral Hermaphroditism has been reported by *Mayer*. This person was named Marie Derrier or Charles Doege, and had been baptized and brought up as a female, but at forty years of age, changed his name and dress to that of a man's. This person, after death, was examined by Professor Mayer, who discovered the existence of a uterus, a vagina, two Fallopian tubes, a testicle, prostate gland and penis. The penis was two inches and three quarters in length, but concealed below the mons veneris. During life it was capable of erection and of elongation to more than three inches. The prepuce covered only half the glans. The vagina was a little over two inches in length, and rather less than an inch in breadth, and terminated above in a fluid isthmus, which represented the fluid orifice of the uterus. The general characteristics of this individual were a mixture of the male and female; the breasts were small, and there was no distinct mammary glandular structure; the stature

was five feet; the head and face presenting the appearance of those of a woman. As age advanced the beard grew, while he menstruated three times during his twentieth year. Professor Mayer likewise states that he had manifested a certain predilection for females, without feeling any special sexual desire.

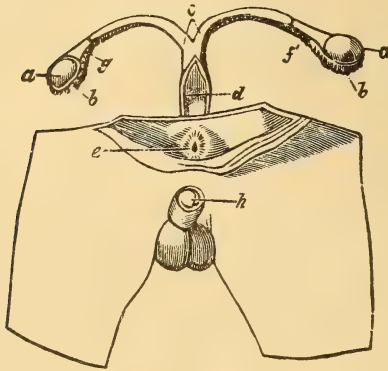
In a note appended to a case published by M. Petit, he states that a man consulted him who menstruated regularly every month from his penis, without any pain or troublesome symptom. This man no doubt had a concealed uterus. In the Cyclopædia of Anatomy and Physiology two similar cases are mentioned. One was that of a young man seventeen years of age; the other a man who had been married several years, his wife having no children. In both these instances there was a copious menstrual discharge regularly every month from the penis. There was no opportunity of examining these cases after death; but there is no reason to doubt that there were internal female organs that communicated with the bladder and urethra.

Mayer, in his work, to which reference has already been made, has delineated five cases, all of which he dissected. The first case, (*Fig. 41*,) was in a foetus of four months, in which he found the bladder, the testicles (*a a*), with the epididymis and a two-horned uterus (*c*) terminating in the vagina (*d*) and opening into the posterior part of the bladder (*e*). From the left testicles a contorted vas deferens (*f*) arose, and ran down to the vagina (*d*); the right vas deferens (*g*) was shorter and disappeared near the corresponding corner of the uterus. The external organs were male, the glans penis being imperforate.

It has been already stated in the present work, that menstruation depends upon a change that takes place in the ovaries, and that such change exerts a marked influence over the general system. *Vaulevier* mentions an instance where

menstruation ceased in a young girl enjoying good health, without any apparent injury to the system, when, soon afterward, a heavy beard began to grow upon her face.

FIG. 41.



A COMPLETE CASE OF HERMAPHRODITIC MALFORMATION IN THE HUMAN SUBJECT
After Mayer, from *Cyclop. Anat. et Phys.*)

a, a, Testicles with their epididymis; *b, b*, and a two-horned uterus *c*, which terminates in the vagina *d*, and which opens into the posterior part of urinary bladder *e*. From the left testicle a contorted vas deferens, *f*, arises and extends down to the vagina; the right vas deferens, *g*, is shorter and terminates in the right of the uterus. The glans penis, *h*, is imperforate.

Similar remarkable changes have been observed to take place in birds. *Greve*, in his "Fragments of Comparative Anatomy and Physiology," states that hens whose ovaries become diseased, will crow like cocks, while they acquire tail-feathers and spurs resembling the male fowls.

The male and female organs seem to be analogous in structure; and from a defect in the formative or typical force of their unfoldment or development, one side may be mascu-

line and the other feminine. M. *St. Hilaire* has offered the following table to show this analogy:

<i>In the Male.</i>	<i>In the female.</i>
Testicles.....	Ovary.
Epididymis.....	Fallopian Tubes.
Vas deferens.....	Corum of Uterus.
Vesicula Seminalis.....	Body of Uterus.
Sheath of the Penis....	Vagina.
Penis.....	Clitoris.

An interesting case of Hermaphroditism has been given by Dr. *Hendry*, of New York, in a letter dated from Lisbon in 1807. The subject was a Portuguese, aged twenty-eight years, of a tall and slender muscular figure. The penis and testicles were in their usual situation, and in form and size resembled those of a male about the same age. The urethra extended to about one-third the length of the penis. The beard had a tendency to grow, but was kept cut short. The female parts resembled those of a well-formed person, except the labia, which were not prominent. The external organs appeared to be situated near the rectum. The breasts were small, voice and manners like those of a female. She menstruated regularly; was twice pregnant, and miscarried in the third and fourth month of gestation. During copulation, the penis became erect, but there never was a desire for copulation with the female sex.

CAUSES OF HERMAPHRODISM.

The chief cause of hermaphroditism appears to be an arrest of development of the sexual organs in their evolution, or to some morbid influence exerted on the embryo, changing its type of unfoldment.

It is known that a division may be made in the perineum, and the fissure remain, from the accumulation of urine in the urinary canal, on account of the imperforate urethra. The cause may also be hereditary in some families. *Heuremann* speaks of a family of females, who gave birth for sev-

eral generations to males who were all affected with *Hypospadias*, or an opening of the urethra on the under surface of the penis, not far from the pubes.

Sir Edward Home mentions that in warm countries nurses and midwives have a prejudice that women born twins with males, seldom breed. The same notion exists among the lower classes of Scotland. This impression, however, has been refuted by *Cribb*, who gives the history of forty-two married females who were born twins with males—thirty-six of whom were mothers of females, and six had no children, though married for a number of years. Two of these females who had families were born triplets with males. The *Medical Repository* of 1827, (p. 350,) mentions an instance of quadruplets consisting of three boys and one girl, all of whom lived. This female afterward became the mother of triplets.

To those individuals in whom the male characteristics predominate, the term *Androgyni*, is applied, while *Androgynæ* embrace those Hermaphrodites in whom the female peculiarities are the most apparent. Thus in an *Androgynus* the general figure of the body may be that of a female; the male voice is wanting, and there is no beard. On the other hand, in the *Androgyna* the masculine developments are the most apparent.

These subjects are regarded as incurably impotent, and the malformation always such as to justify a divorce, but it is no ground for depriving a being of inheritance; nor is the calling of an Hermaphrodite actionable unless it has been attended with some especial damage. A dancing-master once brought suit in England against a party who called him an Hermaphrodite; but the judge and jury decided that the dancing-master had sustained no injury, from the fact, that in the line of his profession he was a much safer person, and none the less qualified than an individual who was more perfectly developed.

CHAPTER IX.

MENSTRUATION.

THE uterus is the efficient instrument in Menstruation, but the organs that cause and regulate it, are the ovaries. These exert a powerful influence not only upon the uterus, but over the entire organism. If the ovaries be removed in a female menstruating regularly, such catamenial flow will immediately cease, whereas it has never been known to occur in females who had no ovaries.

Menstruation consists of a sanguineous discharge, which escapes from the sexual orifice of the vagina in a female who enjoys health, periodically, except during lactation and pregnancy.

The discharge commences at puberty, and is an evidence that the female has arrived at that period of life. In the tropics puberty occurs from the tenth to fifteenth year; in temperate climates from twelve to sixteen years. Menstruation occurs in a healthy female every twenty-eight days, or every lunar month, and continues on an average for thirty years.

Mr. Robertson has given this subject his attention for many years, and prepared a table of four hundred and fifty women, which shows the period of their first menstruation respectively, as follows:—

In the 11th year.....	10	women
“ 12th “	19	“
“ 13th “	53	“
“ 14th “	85	“
“ 15th “	97	“
“ 16th “	78	“
“ 17th “	57	“
“ 18th “	26	“
“ 19th “	23	“
“ 20th “	4	“

It must be borne in mind that this table was formed from observations of females in England.

A remarkable case of early puberty is mentioned by *Dr. Gardner*, in his work on "Sterility." Her name was Phoebe Anna Baker, and was exhibited at Barnum's first "Baby Show" in New York. The Doctor states that he saw her at his office, July 27, 1855, and took the following notes:—

"Phoebe Anna Baker was born at Sing Sing, New York, January 19th, 1851. Her mother has one other child, a boy of seven years. Parents both American. At birth she weighed fourteen pounds, and has always since been large. When ten months old, a bloody flow was noticed from the pudendum, and this has continued periodically ever since, until the present date, without at any time going longer than six weeks, (and when thus protracted showing signs of physical disturbance) without its appearance. About the time this flow commenced, a marked enlargement of her breast was noticed, and these very soon attained to their present size, being now equal to those of most girls of sixteen years, of perfect shape, having a well formed, but not very protuberant nipple, and an areola of a light brown color. She weighs sixty-four pounds, and is of remarkable size for her age, fully developed in form and of a maturity of appearance most noticeable. The hips are full, the limbs rounded, and her form would indicate that she had attained maturity and puberty."

The Doctor further states that when he saw her, as above described, the flow had been retarded for some two weeks longer than usual, and the mother seriously supposed her pregnant, as she had discovered a man (for which sex she evinced great fondness) in an improper situation with her. This man the mother had arrested and detained in prison several days, until the menstrual flow in the girl returned.

This function is so regular in some women that the day and very hour of its occurrence may be predicted with a

certainty. The flow usually continues from three to five days—sometimes for seven days—the interval between being from twenty-one to twenty-five days. In the majority of women this regularity is not observed. In some it occurs two or three days before, or it may be retarded the same length of time without any injury to the system. It has already been stated that menstruation does not occur during pregnancy and lactation. There are exceptions to both these rules. When menstruation takes place during pregnancy, it may occur from the placenta being placed over the os uteri or neck of the womb, or arise from the vaginal portion of the cervix of the uterus.

Mr. *Whitehead* invariably found when menstruation occurred during pregnancy, that the discharge came from the diseased surface of the neck of the womb. A *true* catamenial flow is impossible during gestation or pregnancy, and when it occurs it indicates something wrong, either at the neck or head of the womb.

The quantity of menstrual fluid discharged at each monthly period has been variously estimated, but the usual quantity in females enjoying good health, may be stated at from two to five ounces. The estimates made by different observers, however, are much higher than this. *Hippocrates* and *Galen* state the quantity equal to an attic hemina, which is about eighteen ounces. Haller gives the average at six to ten ounces. Drs. *Whitehead* and *Farne* make it from three to four ounces.

NATURE OF THE DISCHARGE.—It was formerly supposed, and so stated by *Pliny* and others, that the menstrual fluid contained principles of a noxious and poisonous character. *Pliny* informs us that the presence of a menstrual woman turns wine sour, causes trees to shed their fruit, parches up their young shoots, and makes them forever barren, dims the splendor of mirrors and the polish of ivory, turns the

edge of sharpened iron, converts brass into rust, and is the cause of canine rabies.

The menstrual fluid in health has a peculiarly heavy odor, which is characteristic of it, as well as the gravis odor puerperii of the lochial and other discharges of child-bed, which may have led Pliny to arrive at such erroneous conclusions. This, as well as the peculiar odor of the breath of some females, no doubt results from the decomposition of the fluid, as it slowly collects in the vagina of the female and from its absorption into the system.

The fact that the menstrual fluid will not coagulate may have led to the different opinions advanced in regard to its real character.

When it is first formed, it appears to be real blood, but on its passage through the vagina it comes in contact with an acid secreted by that organ, which dissolves the fibrin and destroys its coagulating properties. The composition of the menstrual fluid, according to M. *Denis*, is as follows:

Water	82.58
Fibrin	0.05
Hematosine	6.36
Mucus	3.63
Albumen	4.83
Oxide of Iron	0.85
Osmazome and Cruovine, of each	0.11
Salts and fatty matter	1.59

100.00

The discharge is different when taken directly from the uterus for examination. It is then found to coagulate as readily as blood and possesses all its characteristics. There are many modern physiologists who advocate that menstrual fluid is not blood, but a secretion, from the fact that it contains a small quantity of fibrin. I have explained this by stating that the secretions of the vagina dissolve the fibrin.

Haller and *Hunter* also regarded the menstrual fluid a natural evacuation of blood.

It is generally supposed that the menstrual flux is eliminated by the vagina, os and cervix and body of the uterus. These views are mainly correct, although the principal portion of it is derived from the lining membrane of the uterus.

If the uterus of a female who died during menstruation be examined after death, the lining membrane will be found highly congested, the blood-vessels particularly, the capillaries quite enlarged; while, if a slight pressure be made with the hand, small streamlets of blood will ooze out from the little pores or orifices in the lining membrane. This congestion, however, does not extend lower than the neck of the womb.

The mode in which the discharge takes place has led many to maintain that it is eliminated in the form of secretion, the same as takes place from ordinary glands. From the fact that blood corpuscles are found in the fluid, they must come from the capillaries, which are ruptured by their distension, and that it presents all the appearance of blood, it is unnecessary to reason further against the secretion theory, or in favor of the non-secretion hypothesis. It is most probable that the discharge takes place from the capillaries with open mouths—such arrangement being known to exist in the capillaries of the uterus.

THE OBJECT OF MENSTRUATION.—The mere escape of blood from the uterine walls is of slight importance compared to other purposes which it serves, and which comprehends much significance.

The French term "*fleurs*" and the English "*flowers*," formerly used, had their signification of the office of menstruation. The term suggested, that as a tree before it bore fruit blossomed, so a woman before she bore a child, or became pregnant, also had her flowers.

I have already intimated that a woman does not menSTRU-

ate until she arrives at puberty, and until her ovaries reach a certain development; and, also, that such catamenia continues as long as ovulation is prolonged. I have likewise stated that when the ovaries were removed that menstruation ceased; also, that when the ovaries are congenitally deficient no menstruation occurs. Hence the presence of ovaries is essential for menstruation. When they cease to develop and emit ova, as during pregnancy and lactation, menstruation is likewise arrested. These facts seem to be fully established by modern physiologists.

In addition to this relationship between menstruation and ovulation, there is a direct correspondence existing between each menstrual discharge and the ripening of the ovum. It is the ovaries that produce the pain during the menstrual evacuation. This has been fully proven by the following case, recorded by Dr. *Oldham*:

Both ovaries descended through the inguinal canals and there permanently lodged. After an interval of three weeks both ovaries were observed to become painful and tumid. The swelling increased for three days, remained stationary for three more, and then declined—the time being from ten to twelve days.

These facts, and others that have been mentioned in speaking of the functions of the ovaries and Fallopian tubes, fully confirm the theory that menstruation is caused and maintained by the ovaries, during the process of preparing and ripening the ova, and when the ovum is expelled the excitement of the ovary ceases, and with it the exciting cause producing the discharge from the uterus—the vessels of which contract and arrest the flow of fluid until another period of menstruation arrives.

Having considered the *cause* of menstruation, the *purpose* of such provision may now be stated. It has been affirmed that the quantity of discharge is from three to five ounces, and that the process is repeated in the unimpregnated and

healthy female once in every lunar month, or thirteen times a year, for about thirty years. If three ounces be eliminated it will amount in this period to nine gallons, or seventy-two pounds. If five ounces, to fifteen gallons, or one hundred and twenty-two pounds. The only satisfactory conclusion that can be arrived at in regard to the purposes of Nature in throwing off so large a quantity of blood, is the supposition that it is intended to relieve the congestion of the ovaries that is known to exist during the ripening of the ova. There is no doubt that the Fallopian tubes as well as the uterus, assist in relieving this congestion. If impregnation follows ovulation, the excitement is diverted to a new channel, the uterus, in order to prepare it for the impregnated ovum, which excitement continues until the termination of pregnancy.

Menstruation does not in all cases seem essential to fertility; women sometimes breed without menstruating, while the suspension of the catamenial flux during lactation is not a positive prevention of conception. Girls have also been known to become pregnant before the menstrual age had arrived

Having shown the causes of Menstruation and the purposes it serves, it would seem next in order to speak of the difficulties which attend it, and the medical aid required for its rectification. Such remarks, however, will be found more appropriate to the chapter which treats of the "Diseases of Females," and accordingly, the reader's attention is directed to that portion of the present work for the information that may be desired.

CHAPTER X.

GENERATION.

THIS is considered the most interesting and important part of a work of this character, particularly of late years, when so many different theories have been advanced and strongly maintained by some of the brightest lights that adorn the medical profession. The reader may, perhaps, readily anticipate the views of the author of this volume from what has been already advanced in the preceding pages. The work, however, would be imperfect without a fair presentation and comparison of the facts and opinions of former writers with the latest observations made upon this subject. Hence they will be succinctly stated and analyzed according to their relative importance.

The process of generation is that by which the young of living organized bodies are produced and the species continued. Some animals propagate by a division of their bodies into pieces, each one becoming endowed with an independent existence similar to the parent. Others propagate by buds upon the parent stem, which buds, when they arrive at maturity, separate and retain an individual existence. Another class of animals throw off from their bodies a portion of organized matter, which, after undergoing various processes of development, acquire all the peculiarities of the parent. In the fourth and last class the process is more complex than in either of the others. In this last division, the union of the male and female sexes is necessary for procreation. The reproductive functions require more complicated processes in the higher than in the lower order of animals, in order to the perpetuation of the different species through an undeviating succession of generations.

While speaking of the process of generation in man, it will be appropriate to present some interesting facts respecting reproduction in some of the series of the animal kingdom inferior to the *genus homo*, or man. From what has been advanced in the forepart of this work, the reader will understand that the egg furnished by the female is perfectly *barren* so far as regards progressive development, unless it receives some influence from the product of the male generative organs. This is equally the fact in regard to the product of the male. To render either *fruitful*, there must be a *union* of the two several products of the male and female.

The scientific man, as well as the more ignorant, in all ages, have contemplated with wonder and admiration the phenomena by which the young of animals are brought into existence. The gradual construction of the frame-work of the animal body—the changes necessary for the formation of the brains and nerves, by which man thinks and feels—the muscles that induce locomotion—the process of nutrition, by which the various organs are formed and nourished—all proceeding from the comparatively simple structure of the egg—are well calculated to inspire wonder and admiration of the works of Nature, and lead man to indulge in many absurd and unwarranted hypotheses and speculations, as to the origin and perpetuation of the various animal species.

The ascertained fact that the egg possesses an inherent *vital* power in itself, derived from the parent, and the mode of its being called into action by external physical agents—such as heat, moisture, oxygen and light—the influence exerted on it by being brought into contact with the male sperm—the preservation of the distinct species from generation to generation in undeviating succession—the transmission of hereditary weakness and constitutional peculiarities of form, resemblance and mental traits—all have a tendency to throw an air of mystery over the functions of reproduction.

There is one fact that must be borne in mind, which is, that all the scientific and learned can do, is to investigate matter and observe the laws which control and change its elements. The same elements that now exist, and the same forces, have existed from all eternity. It is the operations of these forces upon these elements, in the formation of new compounds, that we are to study, and this is all that man can do in this life. This investigation constitutes science, and beyond the light of such knowledge no man can safely venture. Hence it is apparent, all that is necessary for the generation of a new being is *matter* endowed with a *vital* force. This force calls to its assistance other physical agents in unfolding organic forms. Such agents are heat, light, moisture and oxygen. It was from the action of the vital force upon matter, with the assistance of the agents named, that the first plant or first animal was formed.

An egg healthily developed, when brought in contact with the male principle, has this vital power awakened in it, and if it can then draw to itself the aid of the several agents already named, will gradually develop a human being, endowed with all the peculiarities of its parent, simply because the *unfolding* or vital principle in the egg and male sperm, is a part and parcel of the parental stamina. It is an established law of nature, that "*Like begets like.*" Should there be any interference with such unfolding or vital force there will be an imperfect development denominated malformation. This vital principle is the *constitution* of the new being, and has imbedded in it, or united with it, all the peculiarities or idiosyncracies, and all the hereditary weaknesses and ailments of its parents. *Females should remember this immutable law, before selecting a partner for life, if they would not entail upon posterity constitutional defects that can never be remedied.*

It is somewhat amusing to contemplate the various the-

ories that have been advanced in regard to generation, in various ages of the world.

Drelincourt, a distinguished author of the last century, names no less than *two hundred and sixty-two* groundless hypotheses of generation, from the writings of his predecessors. *Blumenbach* justly remarks that nothing is more certain than that *Drelincourt's* theory formed the two hundred and sixty-third.

As it would be an endless and fruitless task to wade through all such theories, a few of the more plausible and remarkable ones may be briefly presented in the present place.

One of the oldest theories was that of the *Ovists*. These philosophers maintained that the female afforded all the material necessary for the development of the offspring—the male doing nothing more than awakening this dormant principle in the female. This was the celebrated *Pythagorean* theory. It was also *Aristotle's*, somewhat modified. Some of the old authors who entertained this theory, supposed that the embryo was formed from the menstrual fluid which descended from the brain during sexual union.

Another theory which had many advocates was that of the *Spermatists*. They supposed that it was the male semen alone which furnished all the vitality that was essential for the new being—the female organs simply furnishing a fit place or matrix, together with the materials necessary for its nourishment and unfolding. This was *Galen's* favorite theory.

After the discovery of *Spermatozoa*, those that had supported *Galen's* hypothesis, now maintained that the spermatozoa were miniature representations of men, and called them *homunculi*—some even going so far as to assert that they discovered in them the body, limbs, form and face and expression of countenance of a full-grown human being. They also entertained the idea that these were male and

female homunculi—that if a female homunculum was deposited a human female was developed, and the same of the male.

Another theory was that of *Syngensis* or *Combination*, which supposed that the male and female both furnished semen, which united in the uterus with a third product and developed the egg.

All the theories advanced prior to the seventeenth century are erroneous, on account of the want of knowledge of the character of the egg in reproduction. It was not until Harvey established his dictum of “all life from the egg,” that more rational ideas of reproduction began to be entertained. Upon Harvey’s notions have been based all modern investigations. It led to a discussion of the two theories of *Epigenesis* and *Evolution*. The first is that of non-sexual generation, in which each new germ is an entirely new product of the parent. The other is a theory of non-sexual generation, in which the first embryo contains within itself, in miniature, all the individuals of that species which shall ever exist, and contains them so arranged that each generation shall not only include the next but all succeeding generations.

Harvey and *Malpighi* were the first who endeavored to sustain the theory of *Epigenesis*, as opposed to the old views entertained by the *Ovists* and *Spermatists*. During the middle of the last century, *Haller* and *Bonnett* advocated the opposite theory of *Evolution*.

Those who advocate the *Epigenesis* system maintain that there is no appearance of the *new animal* to be found in a perfectly impregnated egg before the commencement of incubation, or the beginning development of the new being, until heat, oxygen and other agents are applied, when a formative or generative process is established, by which means the parts of the new being are put together or built up by the union of the molecules of matter of which the egg is com-



BEAUTIFUL WOMANHOOD.



UNDER THE VINE LEAVES.

“Those eyes, those eyes, how full of heaven they are.”

Bulwer.

posed. In other words, to be more explicit, this is what may be termed the *material* or *chemical* theory of generation, which signifies that the elements of matter are developed or unfolded into organic forms, by *chemical* changes taking place in said matter without the aid of any *vital* or inherent force.

Haller supported the opposite theory of *Evolution*—that the animal or foetus pre-existed in the egg in an invisible condition, and that by the aid of heat, oxygen, and other conditions necessary for growth, the new being is developed.

Bonnet carried this theory much further than *Haller*. He maintained that not only all the parts of the animal pre-exist in the egg, but that the germs of all animals which are to be born pre-exist in the ovaries of the female—that in the genital organs of the first parents of all species is contained the *germs* of all posterity. In other words, in the ovaries of our great grandmother *Eve*, were contained the germs of every human being that has since existed—that every organic form that now exists, existed in the first parents of the same species and family.

Such are the two extremes that were advocated with much energy and bitterness during the last century.

The theory of *Bonnet* was called the theory of *Emboitement*, to distinguish it from *Haller's* hypothesis of *Evolution*. Recent writings are not altogether free from the vague notions of the older authors. The electric, mechanical, and spontaneous motive theories have all had their advocates, and are still adhered to by many.

Prof. *Burdach* very properly and justly remarks that the generative function in the fruitful egg and the generation of a young animal from it, are *natural* phenomena and no more a secret than other phenomena occurring in organized bodies.

The illustrious *Harvey*, who was a supporter of the theory of *Epigenesis*, so far as the building up out of the elements

of matter composing the egg is concerned, believed there is something behind all this phenomena, which controls and directs the physical forces concerned in the unfoldment of animal forms. He states: "A more sublime and diviner Artificer (than man) seems to make and preserve man; and a nobler agent than a cock doth produce a chicken out of the egg. For we acknowledge our omnipotent God and most high Creator to be everywhere present in the structure of all creatures living, and to point Himself out by His works; whose instruments the cock and hen are in the generation of the chicken. For it is most apparent that in the generation of the chicken out of the egg, all things are set up and formed, with a most singular providence, divine wisdom, and an admirable and incomprehensible artificer." "Nor can these attributes appertain to any but to the Omnipotent Maker of all things, under what name soever we cloud him; whether it be the *mens divina*, the divine mind with Aristotle; or *anima mundi*, the soul of the universe with Plato; or with others *natura naturaus*, nature of Nature himself; or also Saturnus or Jupiter with the heathen, or rather as befits us the Creator and Father of all things in heaven and earth; upon whom all animals and their births depend; and at whose beck and mandate, all things are created and begotten."

A subject closely connected with the present, yet somewhat speculative in character, is worthy of examination in this place. It is the theory of

SPONTANEOUS GENERATION.

All organized beings are subject to death, yet no species of animals or plants become extinct, but continue through an undeviating succession of generations. The mineral owes its origin to the simple union of the particles of which it is composed; but the generation of species of organic forms constitute an *uninterrupted* chain, extending from the first

Fig.1

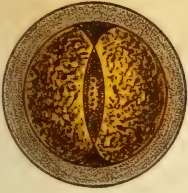


Fig.2



Fig.3



Fig.4

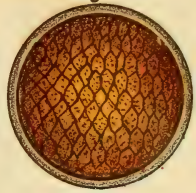


Fig.5



Fig.6

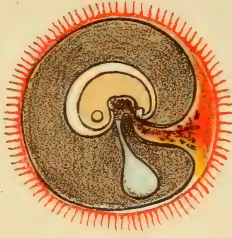


Fig.7

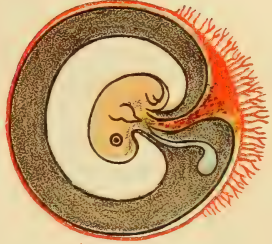


Fig.8



Fig.9



Fig.10



Fig.11



GROWTH OF THE EMBRYO



creation of organic matter, while every new link that is added to this vast chain of organic structure is but an attachment to that by which it was preceded. Indeed, so complete is the law of continued reproduction of organic bodies, that many naturalists have adopted the circumstances of reproduction as the only means of determining which individual ought to be regarded as belonging to one species.

There was a time when it was supposed that some animals might be produced artificially, such as various kinds of worms and molluscous (soft-shelled) animals. The observations of *Redi* and others have proven these views to be erroneous. Spontaneous generation, however, seems to take place in some of the very lowest forms of organized beings; yet, as science progresses, it may be proven that such organic productions are governed by the same general laws of reproduction, by the separation of a living portion from a parent body.

The supporters of spontaneous generation maintain that certain changes of organic molecules are the sole cause of the formation of different kinds of animalculi, as are observed in drops of water, starch, gum, etc., when they enter into putrefaction. The formation of these animalculi will depend upon conditions existing at the time of generation, such as the degree of heat, character of the air, amount of decomposition and the proportion of water.

Spallanzani, a strong supporter of this theory of generation, discovered that an exclusion of air completely prevented the generation of animalculi, and hence came to the conclusion that they existed in the atmosphere.

The experiments of Mr. *Crosse*, a few years ago, in the production of animalculi from solutions of granite, silex, etc., wonderfully elated the advocates of this hypothesis. Not much confidence, however, has been placed in his experiments, from the fact that they have failed in the hands of

others who followed implicitly his directions in their manipulations.

Reproduction of the present day may be divided into sexual and non-sexual:

A. NON-SEXUAL REPRODUCTION.—The Non-sexual Reproduction may be divided into three kinds or classes: *First*, by simple division; *Second* by attached buds; and *Third*, by separate *gemmae*.

The *first* is observed in the *Infusoria*. By dividing the animal into a number of pieces, each one, endowed with an independent life, will develop an individual similar to the parent with all its peculiarities. If a *hydra viredis* be divided longitudinally or transversely, each part will grow and develop that portion of its body of which it has been divested by the division. The tape-worm is another example of this kind. It will live and grow after its segments have been divided into fragments.

The *second* variety—that of *budding*—is best seen in coral and polypi. The young is first seen attached to the body of the parent, and consists of a small conical eminence on the body of the parent. This gradually enlarges cylindrically, while a small cavity forms in the interior, which afterwards communicates with the stomach of the parent, so that food taken into the stomach of the parent penetrates that of the offspring. As the young polypus grows a small opening is next observed in this cavity. This is the mouth, while it is also furnished with tentaculi (feelers). After this the animal obtains food for itself. The cavity between it and the parent is now closed, and it in turn propagates new offspring.

The *third* form of reproduction is that arising from small detached masses or sporules. These bodies are generally round, and may be represented as buds thrown off from the parent stem. They bear the same relation to the parent as the egg in higher animals. To this class belong the sponge.

After being thrown off, it undergoes a process of development into an animal similar to the parent.

B. SEXUAL REPRODUCTION.—In this form of Reproduction, there must exist two animals, male and female. The product of the female is called an ovum or egg; that of the male is a whitish fluid called male sperm or semen. The structure of the ovum has already been given, as well as the characteristics of the male sperm or semen. This form of generation is divided into the two divisions of *viviparous* and *oviparous*.

To the viviparous belong those animals which bring forth their young alive. The human species belongs to this class. To the oviparous belong those that hatch from eggs laid by the female parent. To this class belong birds, reptiles and fishes. In both of these classes the ova are formed in the ovary, and are fecundated by the male within the female.

These general views will now prepare the reader's mind for a clearer comprehension of the most important and interesting portion of this subject, as embraced in the

REPRODUCTIVE FUNCTION IN MAN.

The period of life at which the human being is capable of reproduction is termed *puberty*. At this period important changes are observed in the structure and functions of the system. These changes are more marked in the female than in the male, which may be attributed to the female affording nourishment for the children during the whole of intra-uterine life, while the male furnishes only the material for fecundation.

In infancy and youth the two sexes do not differ materially in their general physical conformations, nor in their mental characteristics. At the period of puberty, however, there is observed a marked antagonism both of the intellectual and anatomical developments. The broad chest and wide shoulders of the male, and the large pelvis and abdomen of the female, constitute the chief peculiarities of difference

between the male and female sexes. The body of the female is smaller, in weight about one-fourth less than that of the male. Her frame is more tapering, the muscles less prominent, the limbs are round and symmetrically proportioned, the bones small, the skin delicate and fine, the voice soft and feminine, while there is that chaste and reserved modesty of demeanor, which is so irresistibly captivating to the other sex. In the male there is the low, rough voice, owing to the large size of the larynx and vocal cords; hair appears on the skin and all over the body and limbs, indicating great physical powers and activity, enabling him to endure much fatigue and excel in deeds of strength and daring. In the male, at puberty, there is also an enlargement of all the generative organs, which is accompanied with sexual feelings and the secretion of semen by the testicles, prostate glands and vesicula seminalis, with occasionally a spontaneous emission occurring at night, generally during dreaming.

In the female there is likewise an enlargement of the breast and genital organs, while there is a peculiar discharge from the latter, termed the "menstrual" flow. It is not out of place here to mention that there is no discharge from females during sexual congress, as many suppose, equivalent to that emitted from the male during such conjunction of the sexes. There is, however, a secretion from the glands of the vagina which serves to lubricate the parts during coition and increases sexual pleasure. The excitement attendant upon coition is paroxysmal in both male and female, the seminal discharge taking place only from the former at the height of such paroxysm.

The period during which the genital functions are exercised is variable in both sexes. In the female the period is usually about thirty years—from puberty at fifteen years, to the "change of life," at forty-five years. In the males it is somewhat longer—generally from forty-five to fifty years, or from the fifteenth year of age to the sixtieth or seventieth

year. There are many instances where the virile powers of the male have been retained even to a much more lengthened period—to the eightieth, ninetieth, or hundredth year. In the celebrated case of “Old Parr,” it continued unimpaired until he reached one hundred and thirty years of age. *Masinissa*, king of Numidia after he was eighty-six years old, begot *Methynate*. *Wadalas*, king of Poland, had two children after his ninetieth year. The Hon. *Jeremiah Smith* of New Hampshire became the father of a child when he was eighty. The author is acquainted with a gentleman who married the first time when he was seventy-five and had two sons by a young wife. There are some cases on record of females menstruating the second time and bearing children at seventy or eighty years of age. I am cognizant of the case of a lady of Philadelphia who commenced menstruating at nearly eighty years of age, and conceived.

SEXUAL FEELING.

In all animals where the distinction of sex exists, there are instinctive feelings experienced to a greater or less extent. This feeling depends upon the temperament of the body and the condition of the mind. In animals the impulse is concomitant more upon a peculiar state of the genital organs, which is manifested at a particular season of the year, known as the “breeding” or “rutting” period. In the female, at this time, a peculiar secretion takes place in the genital organs, the odor of which excites the sexual functions of the male.

In the human species a similar function exists, but which is capable of being placed under intellectual and moral control. When not so governed, this passion is productive of the most revolting obscenity and prostitution. Hence the necessity of legislative enactments to restrain licentiousness and concubinage.

The sexual passion is modified very much in some temperaments. For instance, the sanguine being more voluptuous, love amorous preludes. The bilious are under an erotic fury, which is as great as it is quickly exhausted. The melancholic burn with a secret and more constant flame, while the phlegmatic are cold and insensible.

The temperaments should be more understood than they are by those selecting a partner in life. That happiness which is so desirable in wedlock, is seldom found where the temperaments, sentiments and sexual feelings of the husband and wife are of opposite or antagonistic character. Among the lower classes this incompatibility of impulses or "unequal yoking," as St. Paul expresses it, often leads to adultery, separation, and other domestic discomforts and miseries.

The brain appears to exert considerable influence over the sexual organs. The sexual feelings are more or less under the control of the mental faculties, in the same manner that the action of the heart, digestive process, respiration, secretion, and, in fact, all the functions of the body, are subject to the operations of the intellectual apparatus. It is also a fact that the genital organs excite mental desires.

Phrenologists maintain that the *cerebellum* (or lower brain, back of the head), presides over the sexual feelings, or rather that such impulses belong to that organ, and that it is from thence all sexual desires emanate. It is found that those who have the back of the head and neck large, have the sexual passions more strongly developed than is the case in those persons where such prominence does not exist. The same fact has been observed in animals; while it has been proven by observation that diseases of the cerebellum, such as inflammation, and injuries from gun-shot and other wounds, impair or destroy sexual desires. Also it is known that if the cerebellum be stimulated in any man-

ner the sexual desires are increased in accordance with such stimulation.

Carpenter mentions several instances of this kind. One of these cases was that of a man whose sexual proclivities had always been strongly manifested through life, although they were entirely under the control of the will, until about three months previous to his death, when such erotic impulses increased in a most extraordinary degree. A post-mortem examination after death, revealed a tumor on the *Pons Varolii*. The other case was that of a young officer, who, on the eve of marriage, received a blow on the occiput by falling from a horse. He became impotent, without any other derangement of his bodily or mental powers. In distress upon this discovery of his imperfection he committed suicide on the morning fixed for his wedding.

There are many other instances on record of this character, going to substantiate the phrenological theory that the cerebellum, (or lower brain) is the seat of the amorous or voluptuous passions.

FECUNDATION.

It has been already stated, when speaking of the office of the Fallopian tubes, that impregnation is accomplished by the union of the male spermatozoa and the ovum of the female, during the passage of the latter through these tubes toward the uterus, while the change which takes place in the ovum after the union occurs, has also been explained. (See *Figs. 20, 21, 22, 23, 24.*) If the spermatozoa do not come in contact with the ova, these changes do not take place, but the eggs pass out into the uterus and are lost. It has also been stated that menstruation is a process preparatory to impregnation. In other words, that during the menstrual phenomenon an ovum is ripened and expelled from the ovary; that it is then taken up by the fimbriated extremities of the tube, drawn into its channel and forced, (by a series

of contractions or certain peristaltic action, with the assistance of the *ciliary* lining of the tube,) toward the uterus, which is the receptacle for the further development of the egg or embryo.

As has been remarked, the office of the uterus is to receive the seminal fluid and conduct it into the Fallopian tubes. The neck of the uterus does not, as many suppose, receive the male semen, when it is first ejected from the male intromittent instrument; but it is thrown into a pouch-like receptacle at the upper portion of the vagina, surrounding the mouth of the womb and formed by dilation of that organ. The uterus is suspended in the axis of the pelvis, and in such a position to the vagina that the mouth of the womb is maintained in the very centre of this pouch, (See *Fig. 3*) and thus affording a facility for the semen to pass into the neck of the uterus.

Blundell describes a peculiar movement which he observed in the vagina of the rabbit, that very clearly explains the manner of the introduction of the semen into the uterus. "This canal," (the vagina, says he,) "during the heat is never at rest. It shortens—it lengthens—it changes continually in its circular dimensions, and when irritated especially will sometimes contract to one-third of its quiescent diameter. In addition to this action the vagina performs another," which "consists in the falling down, as it were, of that part of the vagina which lies in the vicinity of the womb; so that it every now and then lays itself as flatly over its orifice, as we should apply the hand over the mouth in an endeavor to stop it. How well adapted the whole of this curious movement is for the introduction of the semen at the opening, it is needless to explain."

The cervical canal is traversed by a large number of furrows, (See *Fig. 4, c, c,*) and (*Fig. 29, B,*) which assist in conducting the semen into the body of the uterus. It is not likely that the ejaculatory act of the male is sufficient to

throw the semen beyond the pouch and against the *os* or head of the womb, inasmuch as the close approximation of the walls of the cervix would prevent it passing further. It is not certainly known in what way the spermatozoa are assisted in their passage through the womb into the Fallopian tubes. It is, however, supposed that the ciliæ which line the cervix or neck of the womb, in conjunction with the approximation of the walls of the uterus, afford the requisite facility for such purpose. The close approximation of the walls of the uterus would naturally facilitate the rise of the semen, the same as water placed between two pieces of glass will rise so as to cover the internal surface of both.

The movement of the spermatozoa is most likely the principal power that is used for their propulsion upward. Indeed, it would appear that it is only by such movements that they can penetrate and pass up the Fallopian tubes toward the ovaries, inasmuch as the cilia that line the cavity of these tubes would rather retard than promote their ascension, for the simple reason that their (the cilia's) wave-like motion is in the reverse direction, or *toward* the womb from the fimbriated extremities of the tubes. There is further proof that the movement of the spermatozoa is the principal agent in their ascension, in the fact of their possessing sufficient power to pass into the egg or ovum on coming in contact with it.

Having thus shown the process by which the semen is received into the vagina, and given some idea of the manner of the passage of the spermatozoa into the Fallopian tubes, it will now be proper to investigate a very important part of the subject of Generation, as included in the question as to—

WHEN DOES IMPREGNATION TAKE PLACE?

The *precise* period at which impregnation takes place in the human female, unfortunately cannot be definitely deter-

mined. From observations, however, that have been made in a large number of cases, it would seem *certain* that it must occur during the *first half* of the *menstrual interval*, most probably during the *first week* after the cessation of the discharge. In sixteen cases observed by *Raciboski*, conception only occurred as late as the tenth day. Notwithstanding the occurrence of impregnation is perhaps ninety-nine per cent. of cases within ten or twelve days after the cessation of the catemenial flux, the other case may occur at any time subsequent to the last and prior to the next menstrual period.

There is no evidence to support the theory that impregnation may occur at any time during each month, by the rupture of an ovasac, as a consequence of sexual excitement. Nor is it likely that the ovum is retained in the Fallopian tubes from one menstrual period to another. Indeed, the contrary is proven by examination made on animals. It has been already stated in this work, that the ovum is usually from six to eight days in passing through the Fallopian tubes of the bitch. In the Guinea pig, the time is from two to three days. In the rabbit it does not extend beyond the fourth day. Therefore, if the theory just mentioned cannot be maintained, the second hypothesis would seem inevitable, viz.: that an ovum, after it is ejected from the ovary, is from six to fourteen days in passing the tubes, and that impregnation must take place during that time. *M. Pouchet* is quite positive that the period is not beyond fourteen days. If the views of this distinguished physiologist be correct, it follows, as a matter of course, that there is a *period after the cessation of the menstrual discharge during which woman is incapable of conception*, which idea *Pouchet* himself adopts as logically philosophical.

No doubt such is the fact, as a general rule, but it may be necessary to account for the occasional mishap, or exceptional case, out of the two hundred that have been named. This is explained by *M. Coste*. who holds the same views

with M. Pouchet in regard to *the time* in which conception takes place after the cessation of the menstrual flow.

Coste supposes that when a chance impregnation takes place after the fourteen days, that it is owing to the Graafian vesicle having failed to expel the ripened ovum, or the one that came to maturity at the last menstrual period, while sexual commerce occurring after this period is sufficient (on account of the excitement attending it) to rupture the follicle and liberate the imprisoned ovum, and thus insure impregnation. To prove this he has presented a number of experiments which he made upon animals. One of these cases is that of a rabbit which during heat manifested great desire for the male, but was not permitted conjunction. Forty-eight hours afterward it was killed, when the genital organs were found very much congested with blood. Six follicles in one ovary and two in the other were ready to burst, but no rupture had yet taken place.

Another experiment also was upon a rabbit, which remained in heat three days, manifesting great ardor. On the fifth day it was killed, when the ovaries were found greatly congested, but without rupture of the follicles. Coste attributes the absence of rupture to the prevention of coitus.

These experiments seem to favor the old theory of conception, viz.: that the ova are detached conjointly with fecundation, and that conception may take place at any time during the interval of menstruation.

Other experiments, however, which have been more recently made, and which have already been presented in this work, set aside this theory as incorrect. It is well known that the ova are ripening during menstruation, and that when this ceases they are no longer eliminated or thrown out of the ovaries. An occasional retention should not overturn a theory that has the whole chain of proof upon its side, with the exception of one link, which deficiency is satisfactorily explained by M. Coste.

In the summary of established facts, then, a recapitulation of the most plausible and rational theory now entertained, may be presented as follows:

It is during the menstrual period that the ova are ripened. They are then received into the Fallopian tubes, and occupy from six to fourteen days in their passage to the uterus. If impregnation occur, it must be from the union of the spermatozoon with the ovum, before the latter has passed out of the tube. Should there be no impregnation, the ovum passes into the uterus and is lost. If five days be allowed for menstruation and fourteen days more for the passage of the ova (though twelve are accounted sufficient) there is accordingly a period of nine days during which impregnation cannot take place except in rare cases, say once in one hundred times, or, indeed, in five hundred times.

PREVENTION OF CONCEPTION.

The question is often asked, "*Can Conception be prevented at all times?*" Certainly, this is possible; but such an interference with Nature's laws is inadmissible, and perhaps never to be justified in any case whatever.

During the past few years hundreds of works have been written, and many circulars distributed, to the females of the land, holding forth the idea that *new* remedies had been discovered for the prevention of conception. It is needless to state that such assertions are impudent and wicked fabrications, and that the volumes and pamphlets are mere catch-penny devices, intended to deceive the public and enrich the pockets of miserable and unprincipled charlatans and impostors.

The *truth* is, there is no medicine *taken internally* capable of preventing conception, and the person who asserts to the contrary, not only speaks falsely, but is both a knave and a fool. It is true enough that remedies may be taken to produce *abortion* after conception occurs; but those who pre-

scribe and those who resort to such desperate expedients, can only be placed in the category of lunatics and assassins!

The only way that Conception may be prevented is by abstinence from sexual commerce during the first fourteen days after the cessation of the menstrual discharge; or else by the destruction of the vitality of the spermatozoa, while in the vagina, or before they pass up through the uterus and come in contact with the ova in the Fallopian tubes, while on their passage toward the womb.

Many plans have been devised by the French for the prevention of Conception, but the most rational and certain means is to dissolve the spermatozoa while in the vagina, and before they pass into the womb. As this subject is treated in another part of this work, it will be unnecessary to say more at the present time on this point.

I have noticed a work recently published in Philadelphia, of considerable circulation, that professes to inform parents how they may have male or female children at their pleasure. It is scarcely necessary to remark that such opinion is absurd and erroneous. The ideas advanced are that the right testicle of the male secretes male semen, and the left testicle female semen. This supposition is equally ridiculous with that of the ancient physiologists, who imagined that the spermatozoa were miniature men and women.

There is not a particle of truth in such speculations. It is well known that men with only one testicle have been known to have had both male and female children. While upon this subject, it may be appropriate to mention certain vague and loose hypotheses that have recently been advanced.

Dr. *Silas Wright*, of New Hampshire, in a paper published in the *Buffalo Medical Journal*, of April 1850, maintains that males are conceived a short time prior to the menstrual discharge, and females shortly after its cessation. In other words, if the ovum be impregnated before the appearance of

the "courses," it will generally grow to be a male; if after the menses, a female child will result.

Again, in regard to the production of the sex, it has been stated that the right ovary produces male ova, and the left female ova.

There is not a particle of proof in favor of either of these theories. On the contrary, there is abundant evidence against their probability.

There are some other miscellaneous matters in reference to Generation that may be appropriately presented in the present chapter

SUPERFOETATION.

Superfoetation is literally the impregnation of a woman already pregnant. About the time the ovum arrives in the uterus, and even before, or about the time of conception, the uterus undergoes a change to prepare for the ovum. There is a sort of a lymph that forms on the outer surface of the lining membrane of that organ, of a flaky or velvety character, which is usually called the bed for the egg. This viscid mucus also blocks up the passage into the mouth of the womb, thus presenting subsequent conception.

Among the lower animals, and in some few cases of the human female, there appears to be *Superfoetation*. It is known that puppies of a bitch will resemble more than one dog with which she has had connection during the period of heat, which time may embrace ten or twelve days.

A mare which had been covered by a stallion was five days afterward covered by an ass, and bore twins—one being a horse, the other a mule.

There are similar cases on record in regard to the human female. Women have borne children of different colors at the same partuition. In one of these instances, the mother acknowledged having admitted the embraces of a black servant



“O, SHE IS ALL PERFECTION!”

Lee.



LOLA.

“Her glossy hair was clustered o’er a brow
Bright with intelligence and fair and smooth.”

Byron.

a few hours after conjunction with her husband, who was white.

Eisenmann mentions the case of a woman bearing a full-grown male child, and neither milk nor lochia (a uterine discharge that takes place after delivery) occurring after birth. In one hundred and thirty-nine days afterward she gave birth to a fine female child when the milk and discharge came naturally. It was supposed that this woman had a double uterus, (see *Fig. 2*) which, however, was not the case, as was verified by an examination after death.

Desgranges mentions a case of a woman who bore two girls at an interval of one hundred and sixty-eight days between them. *Fournier* speaks of two girls born at an interval of five months. *Starke* instances a case of two children whose births were one hundred and nine days apart, while *Velpeau* relates that *Mad. Bigaux* had two living children at an interval of four and half months between the first and second birth.

Dr. Mason published an account of a woman who was delivered of a full-grown infant, and in three calendar months afterward of another, apparently at full time.

A woman was delivered at Strasburg, the 30th of April, 1748, at ten in the morning; in a month afterward *M. Leriche* discovered a second foetus, and on the 16th of September, at five o'clock in the morning, the woman was delivered of a healthy full-grown infant.

Buffon relates a case of a woman in South Carolina, who brought forth a white and black infant; and on inquiry it was discovered that a negro had entered her apartment after the departure of her husband, and threatened to murder her unless she complied with his wishes. *Moseley, Gardien,* and *Valetin,* relate similar cases of black and white children born of intercourse with a white and black man on the same night and the woman having children of different colors at the same parturition.

As has been stated, each male dog will produce a distinct puppy; this no one can deny. The offspring will resemble the males that fecundate the bitch in succession. This is the case with a mare, conjoined to the stallion and ass in succession, and likewise with other animals. Hence, reasoning from analogy, if a number of healthy vigorous men were to have intercourse in succession, immediately after the first conception, it is quite probable and very possible that similar foetation should happen. Dr. *Elliotson* advocates superfœtation, and explains Buffon's case in this way. *Magendie* is of the same opinion. Medical men, and others, should bear in mind that women have had three, four, and five, and even six and seven children at one birth, while various cases of infants of different sizes being expelled in succession are recorded in our own Medical journals.

Professor *Velpeau*, of Paris, speaking of Superfoetation, says:—

“In according all possible authenticity to these observations, regarding their exactitude as demonstrated, the idea which prevails in physiology on generation, permits an easy explanation. Two ovules can be fecundated one after the other, in a woman who accords her favors to two or more men, the same day, or in two or three days afterward; that is to say, to the moment when the excitement of the first coition causes the effusion of coagulable lymph into the uterus, to form the caducous membrane (*decidua*). These ovules may not descend through the uterine tube at the same time, and may be differently developed.”

Velpeau, however, thinks superfœtation impossible *after the decidua is formed*. According to *Deweese*, the closure of the uteri after conception, does not take place for some days, weeks, or months. . .

Admitting superfœtation to be possible, (says *Ryan*) and it cannot be denied in the early weeks of generation, we cannot decide paternity, unless when one infant is black or

brown, and the other white, but if both fathers were of the same color the decision might be difficult, unless some physical mark on the infant existed in one of them."

Some writers maintain that superfœtation is possible during the *two first months* of pregnancy. The majority, however, hold it possible during the first few days after conception, before the uterine tubes are closed by the decidua. This is the received opinion, though there are cases on record which justify *Zacchias* and other jurists to conclude that superfœtation might occur until the sixtieth day, or even later.

INFLUENCE EXERTED BY PARENTS ON OFFSPRING.

One of the most important laws of the reproductive functions, is the preservation of distinct species for an undeviating succession of generations, preventing the extinction of the species by being blended and lost in others.

Most persons are familiar with the resemblance that subsists between families from generation to generation, while it is well known that offspring inherit many of the qualities and peculiarities of the parents. Hereditary resemblance, however, is seldom ever complete—numerous differences being almost always observed in the features and other characteristics of the same family. Male and female children seldom perfectly resemble either the father or the mother, but a blending of the characteristics of both are readily recognizable in the offspring.

It might be supposed that as the mother furnishes the egg and its nourishment after conception, that the offspring would partake more of her peculiarities than of the father's. This, however, is not the fact. There will be quite as much resemblance to the father as to the mother, if such phenomenon be not in favor of the former.

The influence of the father must be imparted to the offspring at the time of the mingling of the spermatozoon and ovum, which is only momentarily. This being the case, it

is reasonable to suppose that the greater proportion of the resemblance of the mother is imparted to the egg previous to conception; although it cannot be doubted that the mother exerts more or less physical and mental influence during the whole period of utero-gestation.

In some animals the male parent seems to exert the greatest influence in the formation of the physical frame. This is particularly the case with dogs, horses, fowls, etc. It is known that the bantam cock will cause a common hen to lay a small egg, and a common cock a bantam hen to lay a large egg.

As a general rule it cannot be said that either the male or female in the human species exerts more influence than the other in the physical and intellectual conformations or peculiarities of the offspring. In some families the children will most resemble the father; in others, the mother's traits are the more predominant.

Dr. *Walker*, in an Essay lately published, states that the upper and back part of the head usually resembles the mother's; while the face from the eyes downward most frequently resemble that of the father.

The transmission of color seems to be better marked than other peculiarities. Two persons of different color cohabiting, and producing offspring, will produce a mulatto. In regard to color the preponderance seems to be on the side of the father. A dark man cohabiting with a white woman will produce a darker child than a dark mother conjoining with a white father.

In some animals the color of both parents seems to be equally preserved. This is the case with piebald horses. In some breeds of horses it has been found that as many as two hundred and five of the offspring or product of two hundred and sixteen pair of horses, the color of the parents was equally preserved.

The qualities of the mind are perhaps as much liable to

hereditary transmission as bodily configuration. Memory, judgment, imagination, passions, diseases, and what is usually called genius, are often markedly traced in the offspring.

I know a man whose mind was so much troubled in consequence of the cares of his business that he became extremely excitable and irritable of temper. His wife bore him a child while this mental disturbance continued. Before its birth, he remarked that its mind would be on the "high-pressure principle." This prediction some years afterward was fully verified.

There can be no doubt that the peculiar mental characteristics of a parent are often repeated in the offspring. In estimating mental and physical inheritances, however, it should be remembered that much will depend upon education, pursuits, and modes of life, as all have a strong tendency to overcome hereditary influence.

The transmission of disease from parent to offspring, is often markedly noticed. Almost all forms of mental derangements are hereditary—one of the parents, or near relation, being afflicted. Physical or bodily weakness is often hereditary, such as scrofula, gout, rheumatism, rickets, consumption, apoplexy, hernia, urinary calculi, hemorrhoids or piles, cataract, etc. In fact, all physical weakness if ingrafted in either parent, are transmitted from parents to offspring, and are often more strongly marked in the latter than in the former.

Where both parents are afflicted with the same disease, the children will have the hereditary transmission more prominently developed than where only one parent is diseased. From observations made in upward of two hundred cases of consumption in 1855-6, I discovered that the child, which most resembled the parent that was consumptive almost invariably contracted the disease and died with it before they had arrived at the middle period of life.

In order to be more perfectly understood, a supposed case may be presented. The father is predisposed to consumption and the mother to nervous affections. They have six children—three of them resemble the father in temperament and other physical and mental peculiarities—while the other three have equally as strong a resemblance for those of the mother. Those that partake of the traits of the father are most liable to consumption and to die of that disease, while those resembling the mother will inherit her infirmities. The children in whose organization are blended the peculiarities of both parents are usually liable to their respective idiosyncracies and ailments.

This law I have found invariably correct. Taking facts like these into consideration, how very important is it for persons before selecting partners for life, to deliberately weigh every element and circumstance of this nature, if they would ensure a felicitous union, and not entail upon their posterity, disease, misery and despair. Alas! in too many instances matrimony is made a *matter of money*, while all earthly joys are sacrificed upon the accursed altars of lust and mammon.

TRANSMISSION OF PECULIARITIES.

A belief is entertained that the frequent breeding in the same family has a tendency to deteriorate a race. This rule appears to be applicable also to the animal kingdom. In the human such deterioration seems to be both mentally and physically manifested. The marriage of *first* cousins, although recognized in this country by law, is strongly denounced by many physiologists as extremely inimical to the perpetuation of a pure-blooded and vigorous race. The inter-marriage of different nations of the same *type*, as that of a Caucasian branch with another branch Ethiopian stock, will tend to the mental and physical vigor of the offspring of either type; but *admixture* of the *Caucasian* with the *Ethiopian*, will *deteriorate* the type of the former race.

An example of the admixture of one Caucasian race with other of the same order of genus, being productive of signal advantage is afforded in the Persian race by their intermarriage with the most beautiful Circassian and Georgian woman. The same may be noticed in all civilized nations. The blending of the Saxon with the Celtic races, for instance, has an important bearing upon the temperament, mental qualities and physical conformations of the intermediate stock or issue. There seems to be an advantageous union of the respective elements of each, increasing physical stamina and intellectual attributes, as well as adding to the symmetry, grace, beauty and manliness of both nations. The union of the mercurial, fiery, and impulsive with the cool and phlegmatic, tends to promote that medium and balance of temperaments which is desirable as the chief characteristic of a proud, noble and perfect man or woman, or even of a nation or people.

The peculiar features, idiosyncracies, or other peculiarities of the Jewish or Hebrew race, are strikingly identical wherever these people are found, in all parts of the world—from the simple fact that they rarely ever marry or mix their blood with other than Jewish people, or with other races, whether of the same Caucasian *type* or not. Were these “peculiar people” to amalgamate more largely with other Caucasian branches of the human family, no doubt the Jewish physiognomy would soon become greatly altered, or modified at least, if not much *improved*.

The *law of Nature* appears to be immutable in respect to procreation or reproduction. The more vigorous the races and types that commingle, the more certain it is that the product will be of an improved and exalted character. The breeders of fine cattle and other animals are cognizant of this principle of Nature, and accordingly select the purest breeds in order to ensure the finest possible progeny. The same law is applicable in husbandry, horticulture, floriculture, etc. The

choicest fruits, flowers and vegetables, are the result of a proper selection of the pro-creative elements and a strict observance of Nature's mandates and requirements. So with the human family. It is doubtless capable of wonderful improvement and exaltation, were there a judicious blending of the highest physical and mental attributes of the male and female progenitors of the species. The *purser* the parent stock, the *more perfect* will be the progeny, and the nearer will they approximate to the original or *primitive type* of excellence, or of organism.

The *stronger* principle very naturally will drive out the *weaker*. Good and bad qualities will not *permanently* coalesce and produce any thing perfect. There will be a *tendency* either to *good* or *evil*. If the good element be the strongest, it will finally eradicate the evil element. If the evil principle be paramount, that which is intrinsically good must succumb before its dominant power.

We have examples of this in the mixture of the black and white races—or rather *types*—of mankind. Whatever may be said of the *unity* of the human race, it would seem that these *types* are entirely *distinct*, and by consequence, could not have sprung from the same original parent stock.

According to the most reliable physiological and other data, there are at least *four* distinct *types* of man, as embraced under the terms Caucasian or *white*; the Ethiopian, or *black*; the Mongolian, or *yellow*; and the Indian, or *red*, however varied or multiplied the branches of each may appear. They are perhaps as distinct in essential elements as the rat and the mouse are distinct, or the monkey and baboon, or the lion and the cat, and were never intended to intermix, nor will they ever *coalesce* if allowed to remain in their normal or natural condition. The very *location* in which these respective types of man are found, favor this theory. The *negro* is as much *indigenous* to Africa or its latitudes and climates, as is the lion and boaconstrictor to the same regions

of the globe; so with the other types of men to their native or specific latitudes. The banana is not found growing in the North, nor the apple in the South. So with flowers, fauna, and other objects of the animal and vegetable kingdoms. All have their *fitting* places, or *locations*, most adapted or suitable for their development, procreation or reproduction. The tiger does not thrive in a northern clime, nor will the bear or hog flourish in the torrid zone. The birds and fowls of a warm climate are different from those of a colder one, however they may resemble each other in many respects, or even when ranked in the same class, or of the same genus or species. These facts are self-apparent, and will require no special argument for their verification.

Take, for example, the crossing of the black and white races of man. The offspring of each successive generation becomes more nearly allied to the *purest* breed of the two—which is that of the *white* or Caucasian type. The progeny became *whiter* and *whiter* until the *dark* or negro element is entirely obliterated. On the contrary, by no process or alchemy of Nature can you ever convert the progeny of a *black* man by a *white* woman to the dark color of the African father. The *vis vitæ* of the two distinct races seem antagonistical and inharmonious, and therefore cannot equally commingle. That of the Caucasian being more highly endowed, overcomes that of the African. The latter after several successive generations becomes completely extinct or absorbed by the former. This is illustrated by analogy, in the fact that the rat of Norway, imported into England and America, has totally driven out the original common rat of these countries. This seems to be a universal law of Nature intended to protect and preserve distinct types—to save the weaker from the stronger. This truth is confirmed in the fact that *hybrids* rarely *propagate*, or if they do, it is only for a limited and definite period. The dominant principle must always prevail. Hence it is easy to believe in hereditary

predisposition, or in the transmission of diseases or peculiarities from parents to offspring. Not only is this the fact, but such abnormal peculiarities may extend through several successive generations. Sometimes they are intermitted or lost in one immediate generation to appear in a subsequent or later one, even to the third or fourth remove from the original malformed or diseased parental stock, agreeably to the text of Scripture, that the "*sins* (or infirmities) of the parents are visited upon the children to the third and fourth generation."

Mr. *Gross* has attempted to arrange a family table exhibiting family peculiarities and resemblances through a series of results from the grandparent to the grandchild. Thus, a grandchild may resemble the grandparent of the same sex; that is to say, a grandson whose father is like *his* (the (father's mother)) will resemble most the grandfather, as in the following table:

1 Generation.	Grandf.	Grandm.	Grandf.	Grandm.
2 "	————	Father.	Mother.	————
3 "	Son.	Daughter.	Son.	Daughter.

It becomes a matter of wonder when we come to inquire into the peculiarities of hereditary transmission, that two microscopic specks, such as the egg of the female and the spermatozoon of the male are capable of transmitting during three or four subsequent generations, all the weaknesses and imperfections of parents. This law, however, even becomes the more surprising, when we come to inquire into the influence exerted by the minds of the parents upon these microscopic atoms at the time of conception, which is to unfold them into the future human being.

We have already given several cases in corroboration of the influence exerted by parents upon posterity, even in the most rudimental or incipient form of embryotic existence. *Combe*, in his great work on the "Constitution of Man," sustains similar views in an admirable manner. The celebrated *Dar-*

win, though he indulged in many chimerical notions, among others that man was originally developed from a *tadpole*—held views respecting the influence of the parent's mental qualities upon the offspring at the time of conception, that appear to be based upon the clearest facts and the highest philosophical deductions. Both of these authors demonstrate that children conceived during or after drunkenness or debauchery, are liable not only to a predisposition to intemperance, but to a debility, both of mind and body, amounting in many instances to idiocy itself. The same is proved of the venereal or amorous impulses. In short, according to the predominance of any propensity or frame of mind, the offspring may be a genius or a dolt, a sentimental swain or an unfeeling brute, a thief, a robber, or a murderer.

These notions are corroborated in too many instances to gainsay their verity, yet I am constrained to think that more importance is attached to them than they deserve, in view of the power of *secondary* causes that may be brought to bear for the correction, amelioration, or eradication of such inherent proclivities. Such influences, no doubt, are capable of being materially controlled by the mother, not only during the embryotic and foetal life of the offspring, but in its physical and mental training in a subsequent period, after it arrives at a proper age, or years of intelligence and reflection. "Just as the twig is bent the tree's inclined," is an axiom as applicable to the human creature as to the tree or shrub. Hence the necessity of having mothers properly educated and fitted to mould the minds and mollify any physical and mental defect in their offspring, in the earlier stages of their existence, as well as having them to understand those laws which are calculated to ensure the rarest beauty and vigor of their progeny, as concomitant of a wise and judicious wedded union of the sexes, and those adjuncts of health and happiness flowing out of pure habits and a rational dietetic and hygienic system compatible with the *vis medicatrix naturæ* of

the general organism. As the potter moulds his clay into beautiful and fantastic devices, so it is largely in the power of woman to *assist* Nature in forming the most perfect and glorious of human intellect and physical developments and conformations. She should ever strive for her own *perfection*, and should never think of marriage until she can possess the proper mental and physical qualifications to become a *mother!* Indeed, the very name of *mother* is significant of everything that is pure and beautiful and lofty. The *model* men—the great and wise and good men—in all ages of the world, owe their exaltation to the pure minds, noble hearts, and heavenly virtues of beautiful and adorable MOTHERS!

The effect of the imagination of mothers upon their progeny, at the time of conception and after, has been doubted and ridiculed by many physiologists. Doubts and sneers and ridicule, however, are the weapons of ignorance and imbecility, and can never be used as *arguments* to overthrow palpable and irrefragable *facts*. Besides what has been advanced in the foregoing pages, there is a great abundance of evidence still at hand, to substantiate all that has been affirmed in that regard. The same influence will hold good not only in the human being, but perhaps in *all* of the lower orders of the animal kingdom.

It is related that when a stallion is about to cover a mare and the color of the stallion be objectionable to the groom, if he will place before the mare during the time of sexual conjunction, a stallion of the desired color, it will have the effect upon the mare to produce the required color in the foal, or a color different from that of its sire. This method has been repeatedly tried with unvarying success.

The tyrant *Dionysius* supposed that handsome pictures and other objects influenced the minds of females during pregnancy so as to have a bearing upon the intellectual and physical attributes of their offspring. Hence, he was in the habit of hanging beautiful paintings in his wife's chamber, in

order to improve the appearance of his children. *Walker*, in his work on "Beauty," supports a similar hypothesis.

The sacred Scriptures speak of Jacob placing the peeled black and willow rods before the ewes as they went to drink and the consequence in the ring-streaked, speckled and spotted colors of the offspring.

The mother of Napoleon the Great, before he was born, followed her husband in his campaigns, and was subject to all the dangers and vicissitudes of a military life. To the influence of the mind of the mother, during utero-gestation, has been attributed the military skill and ambition of the illustrious Emperor of France. On the other hand, the murder of *David Rizzio*, in the presence of *Queen Mary*, was the deathblow to the courage of *King James*, and caused his strong dislike to edged tools, which dislike was a peculiar characteristic of that crafty and pedantic monarch.

It is well known that some contagious diseases are readily transmitted from mother to offspring during utero-gestation; such as syphilis, small-pox, measles, etc. Violence and severe affections of the mother are known to destroy the foetal child, and expel it from the uterus. Poisons have exerted the same influence when taken by the mother during pregnancy. This is easily explained and understood in the fact that poisons enter into the circulation, and that the same blood that circulates in the mother also supplies the foetal child with nourishment.

CHAPTER XI.

NATURE'S INSTITUTES FOR THE PROCREATION AND PERPETUATION OF THE HUMAN SPECIES.

Moral Love and Sexual Passion—Courtship—Marriage—
Effects of Continence—Celibacy Contrary to Nature—
Philo-Progenitiveness, or Parental Love and Care of Off-
spring—When and Whom to Marry—Summary of the
Economy of Human Life.

MORAL LOVE AND SEXUAL PASSION.

MANY persons talk without either knowing what they say, or whereof they affirm. Nothing is more commonly spoken of, or so little considered as the subjects that head this chapter. Let us not waste words in showing how often these important matters are misunderstood and misapplied by the light and the trifling, the gay and the thoughtless, or the vicious and the ensnaring; but trace them at once through all their mazes to a satisfactory solution of their purport.

What then is *Love*! Delightful emotion that binds the mother to her offspring—dear daughter of desire and parent of tender sensibility, heaver of the throbbing heart, and sweet exciter of the maiden's blush, how—how shall we describe thee? Indescribable art thou, a beautiful and pure, as well as an all-conquering passion! No poet can adequately define thee, nor painter portay thee, lovely and all refining, spotless and heavenly as thou art! Yet, all-pervading as thou art, who has not felt the delicious witchery of thy power!

The ancient Greeks represented LOVE under a two-fold aspect. The one was a love for the good and beautiful, the excellent or desirable, in the abstract. The other, besides these qualities, included the love of the sexes for one another. EROS, meant passion, desire, affection or kindness; and the Greek Eros was similar to the Latin CUPIDO, or *Cupid*, the fabled son of *Venus*, who is said to have inflamed mortals, and even the inhabitants of Olympus with arrows from his subduing quiver. AGAPAE which signified love, friendship, affection, charity, etc., and also, (as employed in the Sacred Volume) the love of God to man.

Moral love is the kind which must first claim our cognizance. This sort implies that affection which persons of different sexes feel toward one another. On analysis, we find it to consist in ideas attached in part to matter and in part to mind. Love is pure. It is not what the sensualist imagines it to be. The voluptuary does not know the meaning of the word. The vicious know it not. These follow but a vain shadow—a low, vile passion; not the ennobling, sublimating, soul-refining delights known only to the virtuous, as attached to the idea comprehended in the word *Love*. For instance, two individuals, different in character and pursuits, meet a young lady at an evening party. She is arrived at blooming seventeen. Her form is a fit model for *Phidias* or *Praxiteles*. Her lips are like rubies, her teeth like ivory, her eye like the gazelle's. Her countenance is angelic, and realizes the *beau ideal* of poetic beauty. As she moves in the gay circle of the dance, her whole deportment combines all that is agile with all that is graceful; and as the waving jetty curls flow down her fair neck, the eye rests for a moment on the *embonpoint* of her heaving breast; and the two individuals thus viewing her—the one from the gaming-table and the haunts of vice and debauchery—the other from an unpolluted home, the abode of a loving mother and an affectionate sister—these two individuals see the fair girl at

the same moment, and she inspires the one with *passion*—the other with *love*.

Thus both gaze on her—and while the one would only plot how to rob her of the pearl of virtue, and gratify a transitory passion by sacrificing her purity and happiness to his ungovernable lust—the other inspired by a heavenly sentiment, grows deathly pale, his lips quiver, his voice trembles, and filled with inexpressible tenderness and purest emotions, he views her as the fair star of his destiny, the beacon light of his future; and studying her interests and felicity, no less than his own, he desires to devote his life to the pleasing task of making her happy, and that in the holy state of matrimony.

This is *pure* love, and undefiled. In like manner, a tender maiden sees a man who is the object of her esteem. His comely proportions, his exalted character, his noble disposition, all tend to impress her favorably, and scarce known to herself, she thinks of him when he is absent, blushes in his presence betrays some little tender emotions, and already her heart is his own—she *loves!* Thrilling and delightful emotion in the pure heart of woman! For woman's heart is kind and is not made of rock; on the contrary, it is more like the wax which is pliable and can easily be impressed.

There is thus in the sexes an adaptation to one another. Each without the other, is imperfect. The coarseness of the man, his hardness and asperity, are refined and softened and smoothed down, by the gentle influences of woman. They have a mutual attraction for each other, like the opposite poles of a powerful magnet. The woman may be called the negative pole. She is passive as it were. The motive and exciting power must come from man. Nature has made all creatures perfect, and endowed woman with *static*—man with the *dynamic* force. Thus man and woman but fulfill their destiny when they mate and unite for life, and “multiply and replenish the earth.”

Among animals the *sexual instinct*, is perhaps purely *physical*—at least there is no *reasoning* faculty in them to guide and control and limit such instinct or passion. They have their certain seasons of sexual conjunction—a burning heat consumes them—they are occupied with their desires alone. Scarcely, indeed, do they think of their personal safety during their erotic agitation or excitement. We find as a general rule that animals cohabit at fixed periods and certain times of the year, and afterward seem to lose all sexual passion, in their desire to satisfy their other wants, as of food, etc. On the contrary, man is not subject to the influence of the seasons in the exercise of his genital functions. Man alone has sexual intercourse at all times, and impregnates the female under every latitude and in every clime.

Moral love in man has the same principle with *physical love* among animals. The only difference between them is, the animal seeks directly to satisfy his wants, while reason and moral circumstances prevent man from obeying the mere animal instincts of Nature.

To accomplish the purposes of love, as *Rousseau* has well remarked, men ought to attack—woman to defend. In other words, man should woo, and woman surrender, when she can discover in the prudent and mild guidance of their mutual pleasures, a supporter, a defender, a friend, lover, husband, a beloved companion for life.

As a distinguished writer on “*Kalognomia, or the Laws of Female Beauty*,” well expresses it:—

“If there existed no other than physical love, there would be no difference between the individuals of an opposite sex as in the case with some of the lower animals. Anthony would have found other women as beautiful as Cleopatra; and yet for her he abandoned life and the empire of the world. With regard to beauty, if there existed no *moral love*, every woman, beautiful or ugly, would be equal; there would be no reason for preferring one to another.”

It is *moral* love, then, which is the foundation of all that is beautiful in the tender passion, and of all the interest which erotic writers have thrown around this peculiar sentiment or feeling. Pure affection is not based on mere sexual instinct, but a holier and diviner impulse, although sexual conjunction is not irrelevant to its blissful fruition.

In regard to the mere animal propensity, there may be sensual love without *affection*. At the period of puberty, especially, in both sexes the sexual instinct—as if by a spontaneous internal voice of Nature—at first excites, and then renders man, now in the flower of his life, more prone to the venereal embrace. At this peculiar erotic period, the agitation and disorder of the senses give birth to a new sense, in which man alone seems to receive his existence—in which every thing becomes animated and embellished, and in which all around him appear to burn with the same flame by which he is so deliciously consumed.

COURTSHIP.

Courtship, in which the gentleman does the agreeable, is a very pleasant thing. It is so delightful in itself that many persons never go further. It consists in much billing and cooing, in serenading, and in walks by the lonely lake, or unfrequented path, in the moonlight stroll upon the lawn, or the winsome conversation in the recess of the window, in interchange of love and eternal fidelity, etc. Love makes all harmonize. The coy maiden, it is true, will be very shy, for a while, and “faint heart never gained fair lady.”

A certain brisk confidence must be assumed, for a lady delights in an ardent lover, and many such have triumphed when all others have failed.

For this cause, perhaps, successful villains, who have much practice in the wiles that gain woman’s heart, are more likely to gain their ends than he who truly loves, but is by bashfulness deterred; while in many cases, woman has loved “not

wisely but too well." Yea, under the fairest prétenses, women have been deceived, and under a promise of marriage have permitted the familiarities which prudence, virtue and custom alike reserve for the marriage state. Thus, many a fair, confiding girl is lost to virtue, society and happiness, and robbed by a heartless villain of the pearl of virginity, fills up a degraded and miserable segment in the circle of life, while she might have shone as a star in the galaxy of beauty.

Courtship is a perilous period, inasmuch as human nature is not altogether perfect. Many there are who have begun well. They have continued to do so for days and months, or perhaps for years; but at length giving way to a momentary impulse, the saddest of all accidents has eventuated and such as cannot easily be repaired. Let no one think that we exaggerate. Courtship is but a thorny state after all. It has three stages. The first when the parties meet, and ogling, interchange of glances, and a few hurried words take place. The second, when the whole frame thrills with the exquisitely delicious and melting emotion of the *first kiss*! The third, is that in which "the consummation so devoutly to be wished," is anticipated by plighted lovers who long for the sweets of dear felicitous love in the marriage state.

The first two stages are attended with many hours of pain and few moments of pleasure—many restless nights and heaving sighs. The third stage is not without danger, and should be pushed on to a conclusion as rapidly as rationally proper.

In courtship, there should be a great degree of respect paid to each other by the affianced parties, about one day to become man and wife. They should "look before they leap," count all the cost, and have their minds fully made up, to all the consequences and responsibilities which the married state involves. They naturally will think that all is to be

joy and gladness, peace and "bliss—exquisite bliss," in the possession of each other. Experience, however, has proved to too many, that happiness is not a plant of earthly growth, and many who might have averted it, with prudent foresight, have had to lament an ill-assorted marriage ere the "honey-moon" had waned. Otherwise, and upon the whole, perhaps Courtship is a state of much felicity, and one which the wedded pair will look back upon with delight, if in it they have had mutual respect and esteem, and still maintain the integrity of such true sentiments and fidelity. Thus the enjoyment of reciprocal love is full of bliss on the threshold of matrimony which is yet an unexplored region.

This constitutes Courtship. Hence, the first step must be made by the male, for that the initiative should be taken by the fair lady, is, if not indelicate, at least unusual, or unnatural, except in Leap Year. The male must woo, while the lady must be wooed in order to be won. Madame de Staël, speaking of Courtship, says:—

"How enchanting is the first gleam of intelligence with her we love! Before memory comes in to share with hope, before words have expressed the sentiments, before eloquence has been able to paint what we feel, there is in these first moments a certain kind of tumult and mystery in the imagination, more transitory than happiness, but still more heavenly."

Aristotle well says, "No man loves but he that was first delighted with comeliness and beauty, the graces of mind and the impulses of a pure and generous heart."

MARRIAGE.

The parties are wedded. The priest has pronounced as one, those hearts that before beat in unison with each other. The assembled guests congratulate the happy pair, the fair bride has left her dear mother bedewed with tears and sob-

bing just as if her heart would break, and as if the happy bridegroom was leading her away captive against her will. They enter the carriage. It drives off on the wedding tour, and his arm encircles the yielding waist of her now all his own, while her head reclines on the breast of the man of her choice. If she be young and has married an old man, she will be sad. If she has married for a home, or position, or wealth, a pang will shoot across her fair bosom. If she has married without due consideration, or on too slight an acquaintance, it will be her sorrow before long. But, if loving and beloved, she has united her destiny with a worthy man, she will rejoice, and on her journey feel a glow of satisfaction and delight unfelt before, and which will be often renewed and daily prove as the living waters from some perennial spring.

Happiness then attends the well-mated and congenial pair, who in the morning of life—he in the robust grace of ripened manhood, and she in her youthful beauty and guilelessness of heart—are thus united and on their wedding tour. We will not draw the veil that hides them for a while from the gaze even of their most intimate friends. They are happy each revolving day in the society of one another.

They return from their bridal tour, and are visited by their friends. Congratulations again are poured in, and all goes on in her radiant face. She grows faint at times. She nauseates.

Anon, the fair bride is indisposed. She has hues unusual in her radiant face. She grows faint at times. She nauseates. Her health seems far from robust and several changes have taken place that have arrested her attention at first and seemed to her a new and curious mystery. She consults her physician. It is as she expected. She is in that delicate situation that “ladies wish to be who love their lords.” In short, her rotundity of person, the areola of the nipples, the enlargement of the breast, and other indications, neither few nor unmarked, proclaim her *enceinte*. After a due period of

gestation, she becomes a—*mother*—and sheds tears of joy over her new-born child.

This is then the fruit of marriage. She is bound to her husband with a more powerful chain. Their love is proportionably augmented, and increasing years add to the number of their smiling offspring—a glorious and healthy progeny.

Some have contended that marriage is not a *natural* institution; that the selection of one sexual mate is not a law of our being. This proposition, we think, untenable as it is debasing. For a true interpretation of the law of God, or Nature, we have only to appeal to the voice of God as revealed in the best developed of the lower animals. For instance, the lion, whose voice makes all other animals, and even man, tremble, might assert and maintain his right to *indiscriminate love* without restraint or opposition; yet he selects his companion for life, and lives faithfully attached to that one object of choice and affection all his natural days. The eagle, too, the lord of all that wings the air, quietly chooses his life companion and lives in the bonds of faithful wedlock; and for half a century both labor to feed and rear their young. Do kings and priests make the marriage laws of lions, eagles, geese, and robins? Is their marriage institution an imposition, a burden, a yoke of bondage? If so why do they not assert their freedom in some great “free convention,” or set up a “free-love” community for themselves? As man is an epitome embodiment in himself of all the capabilities and propensities of all the lower animals, we find, among other faculties that of *mating* a predominant disposition. Man is therefore a marrying being, while the instinct or faculty of *union for life* is the basis of marriage and of the laws and customs which recognize the life-choice of one woman for one man. Friendship, it is true, often exists between a man and woman before any other love element is awakened; but a look, or word, or other slight incident,

awakens between them the connubial impulse, and in a moment their views of each other and of their relations for life are entirely changed. Before, they were friends, as two men or two women could be—nothing more; now they are lovers, and henceforth their hopes, aspirations, and joys, run in the same channel. Hence *mating*, or matrimony, is the result, and progeny the natural and legitimate fruit, agreeably to the laws or ordinances of God and Nature.

EFFECTS OF CONTINENCE—CELIBACY CONTRARY TO NATURE.

It is not *continence* but CHASTITY which is at once prescribed by Nature and the laws of Society. It is indeed easy to show that the passion of sexual love is, in a moral point of view, almost as obligatory as the appetite for food.

Nature has destined man to attack, and woman to defend. In other words, she has implanted in the breast of man passions which are less easy of control, than those which she has given to woman. Nature herself has rendered woman less physically able to indulge in sexual love than man, even were she morally so disposed. The periods of menstruation, pregnancy and suckling, are accompanied by more or less of the same indisposition on the part of woman, and leaves the passions with which man is blessed and cursed, in a state of ungratified desperation, if the erotic fury is not capable of being controlled by cool reflection inducing continence and virtue. It is, however, a great mistake to suppose that reasonable abstinence from sexual congress would prove injurious to the virile stamina of the male. The vigor of the *Athletæ* of ancient Greece is proof sufficient on this point. The marriage state, however, with moderate indulgence of sexual love, is best calculated for securing the health and happiness of man and woman. This truth is established in the simple fact that the number of the unmarried insane

of both sexes in the asylums of the land, is about double the number of those who are married. *Absolute continence*, however, has very different effects, according to the sex and disposition of the individual. Among women its effects are not the same as among men. In general, they bear more easily both the excesses and privations of sexual love; yet when these privations are not voluntary on their part, they have generally for women, especially for those who are solitary and unemployed, inconveniences and miseries unknown to the nature of man.

It often happens, that an unmarried woman, under the influence, or, we may say, the domination, of an organ in which the gratifications of love do not temperate the vital energy, drags on a languid existence and is a prey to hysteric and nervous affections. On the other hand, if she fulfill her destiny, and discharge the duty common to all living beings, of reproducing her species, the symptoms of destruction disappear, and the torch of life, formerly on the point of expiring, resumes new light and sparkles with new fires. Is ever a married woman phthisical or epileptic? Is she exposed to convulsions and to a hundred dangerous or mortal ills? Impregnation and pregnancy cure them all, or at least suspend their course. All seem to respect the sacred state of maternity. Nature watches over the young being with a solicitude truly maternal.

Hence, men and women who, from religious zeal, devote themselves to an eternal chastity, often contract an obligation which is above human power to fulfill. Nature rejects it: and the vital action produces the singular phenomena of *priapomania* (or satyriasis) or of nymphomania; the first causing sexual frenzy in males, and the other the use of horrible means of sexual gratification on the part of females. Frequently this erotic fury is communicated by sight, or by a recital, to very irritable persons who are similarly circumstanced, and is propagated like an epidemic

disease. It gives origin to hysteric convulsions and to ecstasies of passion which cannot be subjected to the laws of modesty. *Buffon* indeed relates that even birds when separated from their mates often die of epilepsy. The nuns of Flanders, in the scandalous scenes of their erotomania, and amidst their attitudes of lascivious rage, are said to have bitten each other. The young men who secretly introduced themselves into the convent, cured this sort of malady, which spread through Germany and Holland in the fifteenth century, and prevailed in Rome in 1535. Who, moreover, knows not the history of the erotic convulsionaries of St. Medard, of the Ursulines of Louden, etc. Love, indeed, often punishes with death those who satisfy not this law of Nature. Hence it is, that *Rachel* says to *Jacob* "*Give me children or else I die!*"

In truth, Cenobites are more exposed than others to cancers of the breast and uterus.

It is thus that we perceive that MORAL LOVE and the union of the sexes by the bonds of marriage, are adapted to, and expressive of a primary *Institute of Nature*—THE PERPETUATION OF THE HUMAN RACE.

PHILOPROGENITIVENESS—PARENTAL LOVE AND CARE OF OFFSPRING.

PHILOPROGENITIVENESS, phrenologically speaking, expresses the relations of parents to children. All forms of life are feeble in their inception, are easily destroyed, and need special care and protection. Without such care all that is born would inevitably die, and all the provisions of earth for the happiness of her creatures would be forestalled by the infantile death of all her young. But Nature *must not* lose her race. Especially must she pre-provide for the perpetuity of the *human* family. Nature has made this provision by creating that *strong love* which every parental animal and human being experiences for its *own* young. Why

own young? Why not *all* adults care for *all* children?. Because Nature must *apportion* her work to see that it is done. To make *sure* work, she specifies that all parents shall take the express and special care of their *own* young. She effects this by *parental love*, by creating in all parents a *special* love for their *own* young. Parental love both rears its own children and makes the parent inexpressibly happy in its own delightful task.

Fouriere and many Socialists and "Free-lovers" contend that the *community* should care for the children of the community in gross. If this system were best for man, it would be best, for the same reason, for animals. Why should not all cows suckle all calves in general, and none in particular? Why not all hens scratch for and brood over all chickens in general—nay, cluck and scratch for all ducklings, goslings, hawklings, etc? Why not the lions rear lambs, lion-whelps, pigs, jackals, or the elephant rear horses, dromedaries, etc? Why not make a "happy family" of all animals, man included, and let them herd in promiscuous intercourse, and in support of one another and of the entire bestial social arrangement? See into what absurdities Fourierism and Free-love proclivities would lead us! Nature, however, is not so ridiculous. She has not fitted the elephant to nurse the chicken, or any other animal any creature not of its own begetting. The natural function of Philoprogeneritiveness is love of our *own* young. This is proven by the entire natural history of the parental sentiment all throughout the entire animal kingdom. The maternal hen will scratch and cluck all day, and brood and purr tenderly and patiently all night over her *own* young, but turn another chicken into her flock, and she will peck its pate instantly, even if she has but a single chick of her own. This shows why stepmothers are more partial to their own children than those of their husband's first wife. Now this fondness for our *own* young, and the requisition for rearing them, implies and

requires that we *know* them. Hence the necessity of the marriage relation, and that men and women should be *faithful* in wedlock. Marriage is thus a divine and natural institution—opposed to celibacy, concubinage, harlotry, adultery, and promiscuous sexual intercourse. The fact is, nature has her own laws, and they must not be violated. *Love* thus implies both mating and fidelity, and interdicts free-love and amatory promiscuity in any form. Sexual conjunction, accordingly is only proper after reciprocal love has eventuated in marriage. But marriage itself is not desirable unless it eventuate in its natural product—*children*—which *both* parents can *together* bring up—all as *their own* mutual children, begotten in wedlock. This is *true* love. Hence the *Family state*, or the connubial connection, is the sublimest of Nature's Institutes for the well-being and happiness of man.

WHEN AND WHOM TO MARRY.

The desire for *sexual union* is rarely indicated until the male and female have arrived at *Puberty*. This is a period of life, when childhood is passing from a stage of immaturity of the sexual organs to a full development of their functions. In other words, Puberty is that combination of circumstances in which the passion of love originates. Sex, climate, and manner of living, however, have a great influence on the earlier or later appearance of the phenomena of puberty. Woman attains to this state a year or two sooner than man, and the inhabitants of southern, before those of northern countries. In the hotter climes of Africa, Asia and America, girls are marriageable as early as ten years of age; in the temperate zones, the period of puberty is from twelve to fifteen; while in the colder regions of Russia, Sweden, Denmark, England, the northern parts of the United States and Canada, menstruation, the most

characteristic sign of puberty, is frequently delayed to the seventeenth year. As a general rule, however, in this country, women are pubesces at fifteen and young men at about sixteen.

It will not be necessary in this chapter to present specially all the indications of puberty. We may say, in a word, that it marks itself by certain physical aspects too palpable to the sight and senses to be misunderstood. It manifests itself by the increase of strength and of animal heat, by the impetuosity of the vital motions and by the fire which sparkles in the eyes.

Early marriage, in fact, is a primary law of human nature and, whatever the doctrines of *Malthus* and *Franklin* in respect to over-increase of population, etc., should be consummated while the parties are in the first flush of ripened life, when the affections are pure, and every sentiment refined and ennobling, when man and woman are congenially associated in every element of physical health. A woman at eighteen would not be unequally yoked to a man of twenty-five or twenty-eight; but any greater disparity of ages is seldom ever productive of benefits or felicity. If marriage is delayed too long in either sex, say from thirty to forty-five, the offspring will be puny, and more liable to insanity, idiocy, and other maladies concomitant to the increasing debility of the parties. On the contrary, if she be fully organized and glows with joyous, bounding health and vitality, the early age of "sweet sixteen" may not be an inappropriate season to enter upon the marriage relation, provided her deliberate reason and judgment have sanctioned the object of her affections, and that the man of her choice be equally developed in every manly attribute, and whose age does not greatly exceed her own. Women, likewise, who are too early married, are speedily enervated; and if this takes place before their full growth, they remain always of diminished stature, weak, pale, emaciated and miserable.

The proper age for a woman to marry in this country is, perhaps, about eighteen, but not *then* if she be immaturely developed, suffer from ill health, labor under any malformation, or is liable to hereditary affections of any kind whatever.

We must not, however, always judge of the advancement of the young man by the early appearance of the beard; for it is known that those who abandon themselves early to sexual indulgence have an earlier beard. But if manhood be premature, death is premature also.

But who is fitted to enter upon the important state of matrimony? Who is there that weighs its fearful responsibilities, and measures its chances for enduring felicity or irremedial misery? Surely, in forming the conjugal union, the health and constitution of the parties should be critically regarded. We have no natural or moral right to perpetuate unhealthy constitutions. We have no right to poison the *morals*, or cramp and mislead the minds of children; and we do them and the race a serious wrong in multiplying the number of hereditary invalids. A whole family of children fall before some hereditary malady into an untimely grave. These misfortunes are generally regarded as the inscrutable providence of God, as "severe trials," and "sore afflictions," without dreaming of the *true* causes which produce them.

In the language of Mrs. *Sigourney*, we ask of— "Mothers, is there any thing we can do to acquire for our daughters a good constitution? Is there truth in the sentiment sometimes repeated, that the female sex is becoming more effeminate? Are our daughters as capable of enduring hardships as were their grandmothers? Have our daughters as much stamina of constitution, as much aptitude as we (their mothers) possess? These questions affect the welfare of the community; for the ability or inability of woman to discharge what the Almighty has committed to her, touches

the equilibrium of society and the hidden springs of existence."

Truly, "*First make the tree good, then shall the fruit be good also.*"

It is notorious all over the civilized world that American females are unhealthy, and that the tendency to disease and infirmity is constantly increasing. The daughters, as a general rule, are more infirm than their mothers, as their mothers compare unfavorably with their grandmothers. There can be no question that the *vitality* of our females is running down. This painful fact is evidenced, even in very many young women and girls, in the exhibition of delicate nerves, tender stomachs, falling hair, decaying teeth, and spinal irritation. Even the Medical journals and the ordinary daily and weekly papers of the land, are frequently comparing the health and stamina of American females with those of Great Britain, Germany, etc., and always to the disadvantage of the former. Our young men cannot be ignorant of these things, and hence CELIBACY or "single blessedness," (as it is not probably, under the circumstances, inappropriately termed) is alarmingly on the increase. Young men are, and must be fond of the society of young ladies, and reason and custom incline them to marry, but with the thought of every thing except beds of roses and domestic joys, they refuse to take the lead. So far as courting goes, all is pleasant enough; but with marriage is associated the idea of doctors, nurses, and a constant monologue about pains, aches, bad feelings, morbid sensations, as the prevailing music of the fireside. The young man knows that the chances are against him of marrying a *patient* to take care of, instead of a wife to enjoy. Young men are just as selfish as women—perhaps more so. The young lady who supposes that any young man on the face of the earth wishes to marry her for the sake of nursing her through life makes a great mistake. Young men will play court where they

cannot think of marrying. Whenever they find that their attentions are beginning to be taken in earnest, they will seek other society. They will not of course give the reason for this, and the young ladies will of course wonder, "Why don't the men propose?" Make proposals of marriage, indeed! Surely they will not, when they see the sad evidences of infirmity, which false hair, artificial teeth and expansive skirts are unable to conceal! Nay, they rather avoid all approaches to intimacy, and often abandon the society of those who could be healthy and make good wives, and seek amusement in less respectable society and more debasing associations. Hence the increase of *celibacy*, profligacy, and sensualism in every form. Facts like these are of fearful interest to generations to come. It requires no extraordinary reach of thought to comprehend that the natural and inevitable result must be, sooner or later, the general demoralization of both male and female, and the utter disorganization of human society. Without the maintenance of these domestic associations and duties, which are known only where the marriage institution is made sacred, no society ever did, nor ever can exist above barbarism or savageism.

The young women of America have it in their power to arrest entirely this growing evil. Let them make themselves healthy, and prove their capacity to be useful as well as ornamental, and they will not be long in the matrimonial market. Let them snap their fingers at the fashions of London and the follies of Paris, and act like sensible human beings: otherwise, they are neither fit for wives nor mothers.

A *true* union must be based on an organic law. Oil and water will not mingle. A lion will not lie down quietly with a lamb, nor can ill-assorted marriages be productive of aught but discord.

A SUMMARY OF THE ECONOMY OF HUMAN LIFE IN RESPECT
TO MEN AND WOMEN AND THEIR PROGENY.

The foregoing may be regarded as the ordinary economy

of human life—the romance and misery of ‘love, courtship, and marriage,” as viewed and considered by the masses of mankind. There are, however, other points connected with the peculiar theme which deserved to be scanned in the light of sound morals, health and beauty, as physiologically and philosophically confirmed and established, to secure the physical perfection, happiness and glory of every human creature.

First then let us descant up on the *moral* relations of the subject—reveal the power of desire and love—show the true relation between man and woman—husband, wife and children—and give such caution and advice, as may tend to the highest exaltation and beatitude of the great human family. We adopt accordingly the quaint and judicious words of an ancient Brahmin, as translated from an Indian Manuscript, entitled the “Economy of Human Life.”

DESIRE AND LOVE.

We quote from the Brahmin :

“Beware, young man! Beware of the allurements of wantonness, and let not the harlot tempt thee to excess in her delights.

“The madness of desire shall defeat its own pursuits ; from the blindness of its rage, thou shalt rush upon destruction.

“Therefore, give not thy heart to her sweet enticements, neither suffer thy soul to be ensnared by her enchanting delusions.

“The fountain of health, which must supply the stream of pleasure, shall be quickly dried up, and every spring of joy shall be exhausted.

“In the prime of thy life, old age shall overtake thee : Thy sun shall decline in the morning of thy days.

“But when virtue and modesty enlighten her charms, the lustre of a beautiful woman is brighter than the stars of



EXPECTATION.

Horseback riding is one of the best forms of exercise that can be taken. The continued change of scenery rests the mind and the body gets exercise at the same time.



AT THE MASQUERADE.

Half way through the evening, usually at
Supper time, all the guests are expected to unmask.

heaven, and the influence of her power it is in vain to resist.

“The whiteness of her bosom transcendeth the lily; her smiles are more delicious than a garden of roses.

“The innocence of her eye is like that of the turtle-dove; simplicity and truth dwell in her heart.

“The kisses of her mouth are sweeter than honey; the perfumes of Arabia breathe from her lips.

“Shut not thy bosom to the tenderness of love; the purity of its flame shall ennoble thy heart, and soften it to receive the fairest impressions.”

WOMAN—WIFE—MOTHER.

“Give ear, fair daughter of love! to the instructions of prudence, and let the precepts of truth sink deep in thy heart: So shall the charm of thy mind add elegance to thy form; and thy beauty, like the rose it resembleth, shall retain its sweetness when its bloom is withered.

“In the spring of thy youth, in the morning of thy days, when the eyes of men gaze on thee with delight, and nature whispereth to thine ear the meaning of their looks: Ah! hear with caution their seducing words, guard well thy heart, nor listen to their soft persuasions.

“Remember thou art made man’s reasonable companion, not the slave of his passion; the end of thy being is not merely to gratify his loose desire, but to assist him in the toils of life, to soothe him with thy tenderness, and recompense his care with soft endearments.

“Who is she that winneth the heart of a man, that subdueth him to love, and reigneth in his breast?

“Lo! yonder she walketh in maiden sweetness with innocence in her mind, and modesty upon her cheeks.

“Her hand seeketh employment, her foot delighteth not in gadding abroad.

“She is clothed with neatness, she is fed with temper-

ance; humility and meekness are as a crown of glory circling her head.

“On her tongue dwelleth music, the sweetness of honey floweth from her lips.

“Decency is in all her words, in her answers are mildness and truth.

“Submission and obedience are the lessons of her life, and peace and happiness are her reward.

“Before her steps walketh prudence, and virtue attendeth at her right hand.

“Her eye speaketh softness and love; but discretion with a sceptre sitteth on her brow.

“The tongue of the licentious is dumb in her presence, the awe of her virtue keepeth him silent.

“When scandal is busy, and the fame of her neighbor is tossed from tongue to tongue; if charity and good-nature open not her mouth, the finger of silence resteth on her lip.

“Her breast is the mansion of goodness, and therefore she suspecteth no evil in others.

“Happy is the man that shall make her his wife, happy is the child that shall call her mother.

“She presideth in the house, and there in peace she commandeth with judgment, and is obeyed.

“She ariseth in the morning, she considereth her affairs, and appointeth to every one their proper business.

“The care of her family is her whole delight; to that alone she applieth her study, and elegance with frugality is seen in her mansion.

“The prudence of her management is an honor to her husband, and he heareth her praise with a secret delight.

“She informeth the minds of her children with wisdom, she fashioneth their manners from the example of her own goodness.

“The word of her mouth is the law of their youth, the motion of her eye commandeth their obedience.

“She speaketh, and her servants fly; she pointeth, and the thing is done.

“For the law of love is in their hearts, and her kindness addeth wings to their feet.

“In prosperity she is not puffed up; in adversity she healeth the wounds of fortune with patience.

“The troubles of her husband are alleviated by her counsels, and sweetened by her endearments; he putteth his heart in her bosom, and receiveth comfort.

“Happy the man that has made her his wife; happy the child that calleth her mother.”

HUSBAND.

“Take unto thyself a wife, and obey the ordinance of God. Take unto thyself a wife, and become a faithful member of society.

“But examine with care, and fix not suddenly. On thy present choice, depends thy future happiness. If much of her time is destroyed in dress and adornments; if she is enamored of her own beauty, and delighted with her own praise; if she laugheth much, and talketh loud; if her foot abideth not in her father’s house, and her eyes with boldness rove on the faces of men; though her beauty were as the sun in the firmament of Heaven, turn thy eyes from her charms, turn thy feet from her paths, and suffer not thy soul to be ensnared by the allurements of imagination.

“But when thou findeth sensibility of heart, joined with softness of manners; an accomplished mind, with a form agreeable to thy fancy; take her to thine house; she is worthy to be thy friend, thy companion in life, the wife of thy bosom.

“O cherish her as a blessing sent thee from Heaven. Let the kindness of thy behavior endear thee to her heart.

“She is the mistress of thy house; treat her therefore with respect, that thy servants may obey her.

“Oppose not her inclinations without cause; she is the partner of thy cares, make her also the companion of thy pleasures.

“Reprove her faults with gentleness, exact not her obedience with rigor.

“Trust thy secrets in her breast; her counsels are sincere, thou shalt not be deceived.

“Be faithful to her bed; for she is the mother of thy children.

“When pain and sickness assault her, let thy tenderness soothe her afflictions; a look from thee, of pity and love, shall alleviate her grief, or mitigate her pain, and be of more avail than many physicians.

“Consider the tenderness of her sex, the delicacy of her frame; and be not severe to her weakness, but remember thine own imperfections.”

Truly there is abundance of wisdom, truth, love and justice, in the terse and epigrammatic sentences of the Oriental Brahmin! Are not those sage maxims worthy the thoughtful consideration of every man and woman contemplating marriage, and of those already united in its indissoluble bonds? What purity and bliss, health and beauty, would flow from an observance of these moral obligations and physical restraints, could they be generally enforced and maintained through all the ramifications of human society!

CHAPTER XII.

PREGNANCY AND GESTATION.

PREGNANCY is divided into uterine and extra-uterine. Extra-uterine pregnancy is divided into three kinds—Fallopian pregnancy, Ovarian pregnancy, and Abdominal pregnancy. In extra-uterine pregnancy, the product of conception seldom reaches its full growth, and if it should, cannot be expelled, and its destruction is an inevitable consequence of Nature's error. The foetus usually dies about the second or third month and putrefies.

In natural pregnancy the product of conception is deposited in the uterus, and is there developed. There is sometimes false uterine pregnancy, which will deceive the most experienced practitioner.

A NATURAL OR UTERINE PREGNANCY.

Natural gestation or pregnancy may be said to commence the moment the ovum is penetrated by the spermatozoa in the Fallopian tube, and is subsequently received in the uterine cavity, where it is nourished by the female parent. If the male sperm does not come in contact with the ovum in the Fallopian tube, no change takes place in it, except a slight alteration while on its passage along the Fallopian tube, being received into the uterine cavity where it is ultimately lost or decomposed. After impregnation a series of remarkable changes take place in the uterus, whereby it becomes fitted for the protection and development of the ovum during a period of nine months or forty weeks. The uterus meantime undergoes a new state of growth or development, which is occasioned by the stimulus of impregnation and the growth of the ovum. The ration of increase

of the uterus during gestation is subject to great variation. The enlargement in ordinary cases, is expressed by the following table. The size of the gravid (a fully developed uterus) has already been given in another chapter.

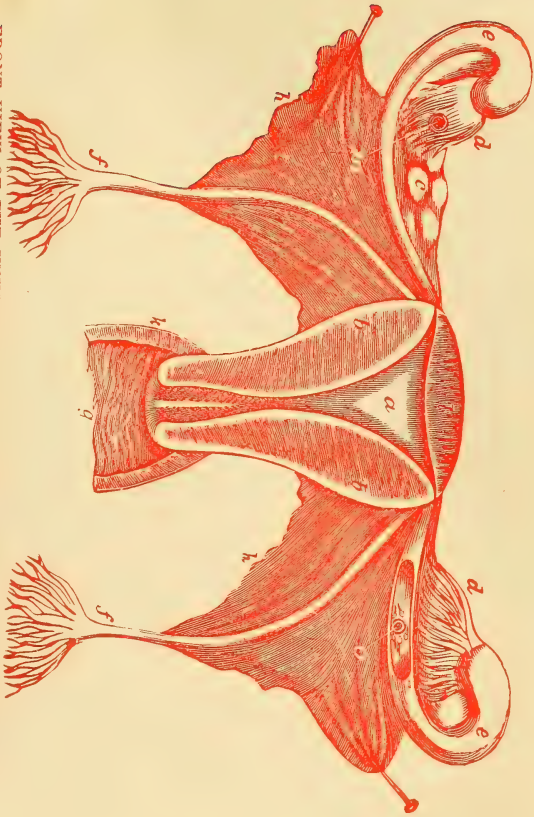
Rate of Increase of Gravid Uterus according to Months.

	Length.	Breadth.
End of 3 months.....	4½ to 5 inches.....	4 inches
End of 4 months.....	5½ to 6 inches.....	5 inches
End of 5 months.....	6 to 7 inches.....	5½ inches
End of 6 months.....	8 to 9 inches.....	6½ inches
End of 7 months.. . . .	10 inches.....	7½ inches
End of 8 months.. . . .	11 inches.....	8 inches
End of 9 months.. . . .	12 inches.....	9 inches

There is considerable change in the form of the uterus during the first four months of pregnancy, without any apparent difference in the figure of the female. From the fourth month there is a rapid bodily enlargement. There is, however, no increase in the thickness of the walls of the uterus. On the contrary, they become gradually thinner, up to the period of nine months. The neck of the womb commences to shorten about the fifth month; at the end of nine months it is obliterated, which is occasioned by the lateral extension and expansion of the uterus.

It is now necessary again to trace the ovum from the time it is expelled from the ovary and received into the Fallopian tube. It has been stated that no apparent change occurs unless it is impregnated by the male sperm, which impregnation usually takes place in the middle and lower third of the tube. When the ovum of the egg is expelled from the Graafian vesicle, it has attached to its surface a portion of the membrana granulosa. (*Fig. 20.*) As the egg passes along the upper third of the tube, this layer of cells becomes divested. (*Fig. 21.*) Should it now meet the male sperm, material changes take place. The spermatozoa readily pen-

FIG. 5.



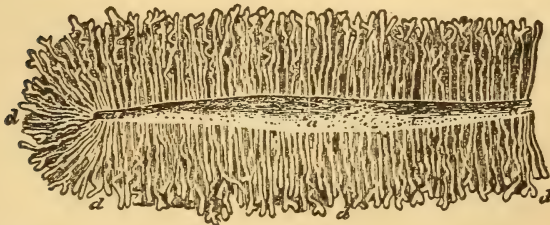
FRONT VIEW OF THE UNIMPREGNATED UTERUS AND ITS APPENDAGES AND SECTION OF VAGINA.

a, cavity of uterus; *b*, body of uterus, *d d*, fimbriated extremity of Fallopian tube; *c*, Fallopian tube; *f*, round ligaments; *h*, broad ligaments; *k*, walls of Vagina; *l*, fundus of uterus; *g*, Vagina, *m*, fimbriated portion of tube grasping an ovum; *o*, ovum surrounded by spermatozoa in lower third of Fallopian tube during its passage toward the uterus. It is in this part of the tube where impregnation usually takes place.

erate the soft covering of the yelk. There is next a cleavage of the yelk substance, (*Fig. 22.*) which continues dividing and subdividing until it is broken up into a granular mass. As the egg passes the latter third of the tube another change is observed—that of a deposit of albumen around the *zona pellucida*, or outer covering of the egg. (*Fig. 24.*) On the outer surface of this albuminous deposit are developed villi. The addition of these villi form what is called the chorion, which becomes very vascular. These villi project, forming a bulbous expansion (*Fig. 29, C.*) which serves as an absorbing point, and thus affords the channel through which the embryo is nourished, until a more perfect communication is established.

Having thus traced the ovum in its passage to the uterus, it is now proper to speak of the changes which take place in that organ—(changes not from the presence of the ovum, but in consequence of conception.) One of those is the formation of the *membrana decidua* as it is called, from the fact of its being thrown off at each parturition. This is not a new membrane formed within the uterus, as formerly supposed. The observations of Dr. *Sharpey*, and others, proved that it is merely composed of the inner portion of the

FIG. 42.

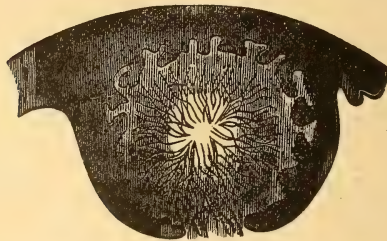


SECTION OF THE LINING MEMBRANE OF THE HUMAN UTERUS AT THE PERIOD OF COMMENCING PREGNANCY.—(After E. H. Weber)

d, d, d, shows the arrangement and other peculiarities of the glands, with these orifices, a, a, a, on the internal surface of the organ. Twice the natural size.

lining membrane of the uterus, undergoing considerable change in its character. This lining membrane is tubular. (*Fig. 42*) These tubes become thickened a short time after conception, and are lined by an epithelium similar to the lining of the gastric follicles or tubes of the stomach. After the thickening of these tubes, a fluid is poured out from them, which fills up the cavity of the uterus. Into this secretion the ovum is imbedded. The villi of the chorion receive nourishment from this secretion, or from the tubes direct. In the dog the villi have been found piercing the mouth of their tubes and drawing nourishment from them. The secretion that fills the cavity of the uterus, and in which the ovum is imbedded, grows up around it and forms the membrane decidua. (*Fig. 29, c, and Fig. 43.*) This continues until it has completely enveloped the ovum, and forms

FIG. 43.



ADVANCED STAGE OF THE DECIDUA REFLEXA AROUND THE OVUM.

the decidua reflexa. The uterus, or womb, is also lined by a decidua, called *decidua vera*. As the ovum grows, the space between these decidua is diminished, and they ultimately come together. This junction occurs about the third month. (*Fig. 44.*) At this period they can scarcely be distinguished as two distinct membranes. In the early state of development of the chorion, it contain no blood vessels, but receives its nourishment by drawing in fluid through

its villi or tufts. In this way the embryo is nourished until the placenta is formed. The placenta is formed by the prolongation or extension of the tufts of the chorion forming one side of the placenta, properly called the foetal side of the placenta. While the foetal portion is thus being formed by the extension of the tufts of the chorion, the blood-vessels of the decidua also enlarge, so as to form sinuses or canals.

FIG. 45.



DIAGRAM OF THE STRUCTURE OF THE PLACENTA —(From Carpenter)

a, substance of the uterus; b, the cavity of the sinus; c, c, foetal tufts dipping down into the sinuses; d, d, the decidua lining of the uterus; e, curling arteries of the uterus; f, f, branches of fetal tufts forming the umbilical vessels.

(Fig 45, b, and Fig. 46, b.) Into these sinuses the villi of the chorion penetrate and are completely bound in. (Fig. 45, c, and Fig. 46 d.) In this way the placental cavities or sinuses are intersected by numerous tufts and bound down

FIG. 46.

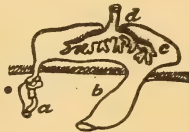


DIAGRAM OF THE PLACENTAL CAVITY —(After Dr Reid)

a, curling artery of the uterus; b, sinus of uterus; c, cavity of the placenta; d, foetal tuft imbedded in it, and held there by reflection of its walls.

by the delicate membrane forming the walls of the deciduum. (Fig. 45, d, d, .) The placenta thus formed is supplied by

“curling arteries of the uterus” (*Fig 45, e*), and the blood returned to large veins called sinuses or canals. (*Fig. 45, b.*) The extremities of the foetal vessels being retained in their sinuses are bathed into the blood of these canals, receiving oxygen from the maternal blood and parting with its carbonic acid. These tufts may be compared to the rootlets of plants, imbedded in the ground, and absorbing moisture and nutrition from the soil.

The excrementitious substances of the foetus are most likely passed off to the mother in this way. By the same process, poisons, and various constitutional diseases of parents, may be conveyed to the child. This is the only direct communication between the mother and child, viz: the bathing of the foetal tufts in the venous sinuses of the mother. The placenta begins to form about the latter part of the second month, and is sufficiently developed during the third month to supply the foetus with nourishment; and continues to develop or increase with the growth of the embryo.

The blood-vessels of the uterus, particularly the part to which the placenta is attached, also undergo great enlargement. The blood flowing through them produces a peculiar sound, and is the most positive sign of pregnancy. This sound is described by Doctor Montgomery as “the placental bruit,” and resembles that produced by gently blowing over the lip of a wide-mouth vial, being “accompanied by a slight rushing noise.”

It should have been stated that while the chorion is being developed, the amnion is likewise formed by two folds of serous laminae. These are the lining membranes of the chorion; they gradually approach one another, and finally meeting enclose the embryo, thus forming an additional investment to the embryo. It is not known at what period of embryotic life this membrane is formed. It takes place in the chicken on the third day. It is this membrane that en-

FIG. 44.



UTERUS IN THE FIRST MONTH OF GESTATION; SHOWING THE FORMATION OF THE FŒTAL CHAMBER BY THE MEMBRANÆ DECIDUA.

u. uterine walls traversed by numerous blood-vessels; *d v.* decidua vera, or developed lining membrane of the uterus, the uterine glands or canals being much enlarged; *d r.* decidua reflexa, in which lies the ovum *o*, which is still at this stage unattached; *c.* corpus luteum.

closes the *liquor amnion*. This fluid consists of water, holding in solution a small quantity of albumen and salts, and resembles dilute serum of the blood. The amnion not only encloses the liquor amnii, but secretes it. In some females previous to labor it amounts to several quarts. If there be a large quantity of water, the labor will be lingering; which is owing to the great distension of the uterus. Sometimes this distension is so great that it becomes necessary to let off the water previous to labor, in order to overcome the difficulty of breathing, and the influence which the distension has over the function of the stomach and other vital organs.

GROWTH OF THE EMBRYO.

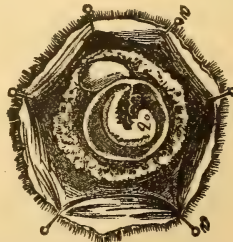
Before the seventh day there is nothing in the uterus to indicate a new being; probably the ovum has not yet passed from the Fallopian tube. On the tenth day, a semi-transparent grayish substance of no definite form is observed. From the twelfth to the fourteenth day there is perceived a vesicle of the size of a pea. This contains a thick fluid, in the midst of which is found an opaque spot, being the first evidence of a new being, and bearing the name of an embryo, surrounded by the chorion and amnion. The weight at this period is about one grain. (*Fig. 47.*) At twenty-one days it resembles in form a large ant, and is about the third of an

FIG. 47.



EMBRYO OF TWELVE TO
FOURTEEN DAYS LAID
OPEN.

FIG. 48.

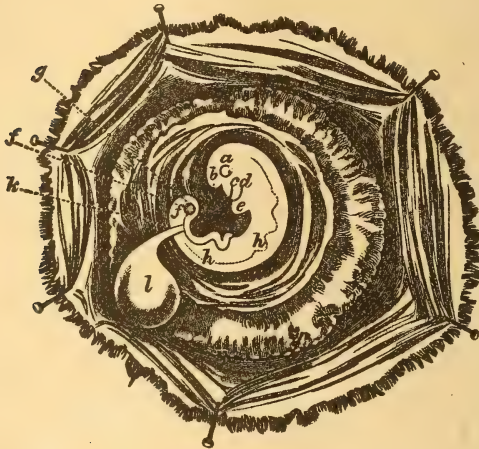


EMBRYO OF TWENTY-ONE DAYS
LAID OPEN.

a, a, a, chorion laid open and
secured by pins; b, the embryo
with amnion laid open.

inch in length, and weighs about four grains. (*Fig. 48.*) At this period cartilage, which subsequently becomes bones, is forming. On the thirtieth day the embryo is about the size of a horse-fly, and looks something like a worm that

FIG. 49.



EMBRYO OF THIRTY DAYS

a, Head of embryo; b, the eyes; c, the mouth; d, the neck; e, the thorax; f, the abdomen; g, the extremity of spine; h, h, the spinal arch; k, neck of umbilical vesicle; l, the vesicle.

is bent. A faint outline of organs is now perceived—the head appearing larger than the body, while there are spots indicating eyes. The embryo is about one inch in length and weighs twelve grains. (*Fig. 49.*)

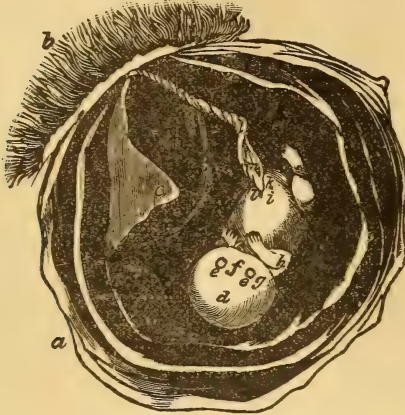
At the forty-fifth day the body of the embryo is lengthened, while the eyes, mouth and nose are strongly marked. The length is over an inch, and the weight about sixty grains. (*Fig. 50.*)

At sixty days, or two months, the eyes are enlarged, and the eyelids are visible; also the external part of the ear; the nose is slightly prominent, the mouth clearly defined, the

heart partially developed, while the soft and pulpy substance of the brain is being developed. (*Fig. 51.*)

At ninety days, or three months, the embryo is better

FIG. 50.



EMBRYO OF FORTY-FIVE DAYS

a, a, a, chorion; b, villiosities of placenta; c, c, amnion; d, head of embryo; e, e, temples; f, interval between eyes or root of nose; h, the arms; i, the abdomen; k, the sexual organs; l, l, umbilical cord; m, the internal portion of cord.

defined; the eye-lids are well-formed and closely shut; the organs of generation, in either sex are prominent; the heart is plainly seen, and beats with force, the vessels carry-

FIG. 51.



EMBRYO OF SIXTY DAYS OR TWO MONTHS

ing red blood; the fingers and toes are well defined. The length of the embryo is now about four inches, and its weight two ounces and a half. (*Fig. 52.*)

FIG. 52.



EMBRYO OF THREE MONTHS ENCLOSED IN THE AMNION

At four months the embryo is perfect. After this period it is called the foetus. From this time, the head and liver, instead of increasing, decrease in size; the brain and spinal marrow become more consistent, while a small quantity of meconium collects in the bowels. The muscular system also is now quite distinct, and the foetus perceptibly moves. Length about eight inches; weight from seven to eight ounces. (*Fig. 53.*)

At five months, or one hundred and fifty days, the muscular system is well marked and the movements of the child



RELATION OF OVARIES, OVUM, OVADUCT, AND UTERUS IN MAMMALIA

A. Reproductive organs of the rabbit, ten days advanced in pregnancy: *aa*, right and left ovaries, four corpora lutea in the right and two in the left; *bb* fimbriated openings of the Fallopian tubes; *cc*, the Fallopian tubes; *dd*, right and left cornua of the uterus, with four dilatations on the right and two on the left containing ova. one of the right ova is exhibited by a division in the left horn of the uterus, *e*, the body of the uterus; *f*, the vagina.

B. Transverse section of the human uterus twelve or fourteen days after conception: *c*, the uterine cavity, in which the ovum with its villous chorion is imbedded in the decidua; *cc*, the Fallopian tubes cut short, by one of which the ovum has just descended while still of same size.

C. Enlarged view of the exterior of the human ovum twelve or fourteen days after conception, showing the villi of the chorion projecting from its surface.



can no longer be doubted. The lungs are developed and may be distended to a certain extent. The meconium passes through the greater portion of the intestinal canal. The

FIG. 53.

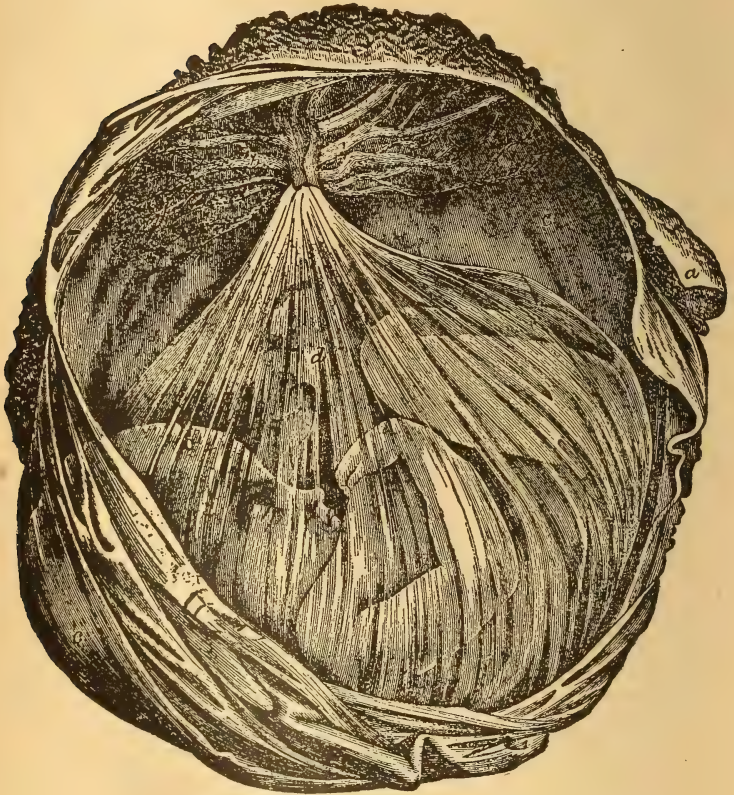


FOETUS AT THE AGE OF FOUR MONTHS

whole form of the child is now perfectly distinct; length ten inches; weight one pound. No evidence yet of the intellectual functions. (*Fig. 54.*)

At the sixth month, or one hundred and eighty days, down makes its appearance upon the head, and the nails are distinguishable. The whole form of the child is more distinct; length twelve inches, weight two pounds.

FIG. 54.



Fœtus at the age of five months, with the placenta and membrane. The chorion is laid open to exhibit the fœtus enclosed in the amnion. The amnion is attached to the center of the internal surface of the placenta, through which the cord passes. The external surface of the placenta is seen covered by the chorion and decidua.



DRESSED FOR THE FANCY BALL.

“Soft eyes looked love to eyes that spake again,
And all went merry as a marriage bell.”

Byron.



THE SILHOUETTE.

While waiting she makes the time pass
Pleasantly, cutting out the picture of her lover.

FIG. 55.



FOETUS OF SEVEN MONTHS.

At the seventh month, or two hundred and ten days, the nails are formed; hair is seen on the head; the testicles descend into the scrotum; bones are completely formed, and the features well developed. A child born at this period can cry, breathe and suck. The intellectual functions are still

undeveloped, but the senses are susceptible of slight impressions. Length fourteen inches; weight three pounds. (*Fig. 55.*)

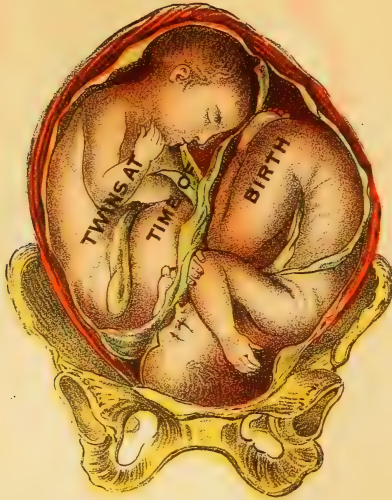
At eight months the fœtus gains strength and volume; the form of each part is being more fully perfected. Length sixteen inches; weight four pounds. Intellectual faculties still undeveloped, but the senses are more acute.

Nine months or forty weeks is the natural period of gestation, involving the birth of a healthy child. The organs, at this period, have acquired the growth that is necessary to support life. The motions of the child are lively and quick; the heart pulsates rapidly and the blood circulates freely; the blood is rich and abundant: the alimentary canal, which has had heretofore no perceptible action, now contracts upon the meconium, and causes it to escape by the anus. The length is eighteen inches; weight six to eight pounds. Intellectual faculties still in abeyance; senses quite acute. The child is sensible to pain, and cries from hunger and cold; while warmth, nursing, and gentle rocking, puts it to sleep. (*Fig. 56.*)

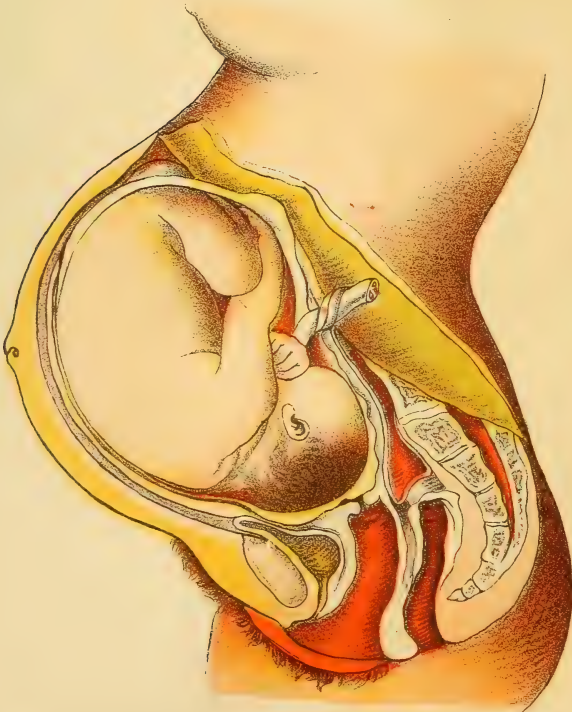
THE PLACENTA.

The formation of the placenta and its attachment to the walls of the uterus, have been already described. It is by such union that the child obtains its nourishment from the mother.

In pregnancy, the placenta is a spongy, cellular, vascular mass—generally circular with flattened sides. It is about one inch in thickness, and from seven to eight inches broad; its weight, with the cord, from twelve to fourteen ounces. The uterine face of the placenta adheres to the walls of the uterus during the whole of pregnancy, generally to the fundus, though in rare instances it is found attached over the mouth of the womb. When the latter is the case, the pla-



NATURAL POSITION OF TWINS



NATURAL POSITION OF THE CHILD AT PERIOD OF NINE MONTHS

centa will be delivered before the child. If labor is slow, the child cannot survive, from the fact that the connection with the mother is cast off. There is also great danger of hemorrhage. When the placenta presents, death may result from it, especially if the labor is prolonged. The umbilical cord is generally inserted near the centre of the placenta. (*Fig. 61.*) The color of the cord is dark red, while it, (the cord) is composed principally of blood-vessels and fibrous tissue—the latter uniting the blood-vessels in a compact mass. Every foetus has a placenta; if there be twins, there will be two placentas united by their edges. There will also be two cords in such case. Should there be six or eight children—there being such instances on record—there will be a placenta for each. So with every number of children. In this way the circulation of each child is distinct.

THE UMBILICAL CORD.

The umbilical cord is very short at the beginning of pregnancy, and is composed of the umbilical arteries and veins. The length at parturition is from eighteen to twenty-four inches. It extends from the umbilicus of the child to the placenta, and is divided at birth. (*Fig. 61.*)

NUTRITION AND CIRCULATION OF THE FOETUS.

It is no longer doubted that the foetus is nourished by the fluids of the mother, through the placenta and umbilical cord.

It has been frequently asserted that the infant is nourished by sucking the fluids that inclose it, and that these, on entering the stomach, are subject to the laws of digestion and assimilation. and thus become elements of nutrition to the foetus. This hypothesis is not well sustained. From analysis of the liquid amnii, it is found that it does not

possess the elements necessary for nutrition. At the end of pregnancy, they are often turbid and purulent. Sometimes the membranes are ruptured for several weeks before labor, and the water eliminated. Such being the case, the child could not live, which fact would go to overthrow the theory heretofore entertained, as stated in the present connection.

It has also been supposed that the fœtus is nourished by absorption through the skin. As the waters have not the necessary qualities of nutrition, this cannot be correct.

We should look upon the fœtus during pregnancy as an offshoot of the parent, and nourished as such through the medium of the blood of the mother. When it arrives at maturity, it is thrown off, and is in a condition to subsist without this connection or union. Yet it still depends, in a measure, upon the mother for support or nourishment.

The circulation of the fœtus before birth being different in several respects from what it is afterward, it will not be uninteresting to give a brief description of it here.

The lungs of the fœtus cannot perform their office—which is the elimination of carbonic acid and the reception of the oxygen of the air. Neither can the digestive and assimilating organs perform their office. Therefore the mother must furnish the necessary fluids for nutrition. This is done through the umbilical vein. This vein arises in the placenta and passes direct to the umbilicus, without communicating with the umbilical artery. It then penetrates into the abdomen, and passes directly into the great fissures of the liver, where it gives off two twigs, one for the right lobe and the other for the left lobe of that organ. Another portion of the blood is carried through the ductus venosus to the ascending vena cava. The blood that passes through the liver is also conveyed to the ascending vena cava, through the hepatic veins. The ascending vena cava conveys the blood into the right auricle of the heart where it becomes mixed with the blood from the descending vena cava, which

collects the blood from the head, neck and upper extremities.

The blood from the ascending vena cava is directed through the foramen ovale into the left auricle, while the blood of the descending vena cava is directed into the right ventricle. When the ventricles of the heart contracts, the arterial blood which the left contains is propelled into the ascending aorta, and supplies the branches that proceed to the head and upper extremities before it undergoes any admixture; whilst the venous blood contained in the right ventricle is forced through the pulmonary artery and ductus arteriosus into the descending aorta, mingling with the arterial current which that vessel previously contained, and thus passing to the trunk and lower extremities. Hence the head and superior extremities, whose development is required to be in advance of that of the lower, are supplied with blood, nearly as pure as that which returns from the placenta; while the rest of the body receives a mixture of this with what has previously circulated through the system, and of this mixture a portion is transmitted to the placenta through the umbilical artery, to be removed by coming into relation with the maternal blood. (*Fig. 61.*)

After birth, a most remarkable change takes place in the circulation of the child. As soon as the air enters the lungs, respiration is established—the blood which was before black now becoming red and light. The blood returns for the first time through the pulmonary veins into the left auricle, depressing the valve of the foramen ovale, and thus preventing the blood from passing through into the right auricle. It is carried from the left auricle into the left ventricle, and thence into the aorta to be distributed to the whole system.

During pregnancy, the blood at the lower part of the aorta, at its bifurcation, proceeded through the umbilical arteries. After birth, instead of passing through these, (which have become obliterated), it is sent into the iliac arteries,

and abundantly distributed to the lower extremities. The blueness of children after birth is occasioned by the opening of the foramina ovale not being closed, causing a mingling of the venous and arterial blood. When this is obliterated, the blueness disappears.

It has been already stated that the weight of a full-grown child at birth is from six to eight pounds. When the weight is less than five pounds, the child is considered delicate, feeble, or sickly, and will be raised with difficulty. If the weight be above eight pounds, the child is considered large, which causes labor to be slow and sometimes difficult, requiring artificial assistance.

SIGNS OF PREGNANCY.

Pregnancy begins immediately after conception, and terminates by delivery of the fœtus at parturition.

FIG. 57.



POSITION AND SIZE OF THE UNIMPREGNATED UTERUS

The duration of pregnancy is nine months, or forty weeks. The period may be retarded or advanced some days. Births may occur at the thirty-sixth week, or the period of gestation may be extended to the *forty-fifth* week. There are cases of the kind on record, which have been subject to medico-legal investigation and proof.

The signs of pregnancy are usually divided into the *presumptive*, or rational, and the *positive*, or sensible.

FIG. 58.



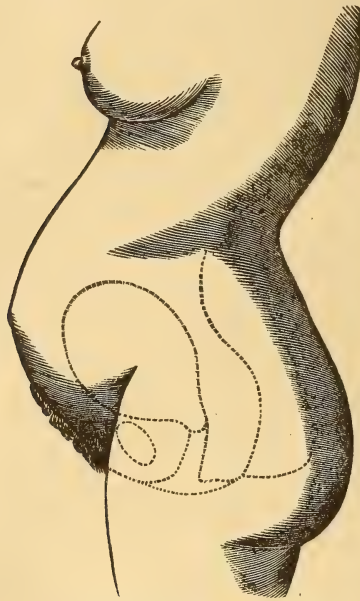
POSITION AND SIZE OF THE IMPREGNATED UTERUS, OF THE PERIOD OF THREE MONTHS

The presumptive or rational signs are those that lead to a suspicion that a female is pregnant. These are numerous, the principal ones being as follows:—Suppression of the menses, discolorations of the areola of the breast, its brownish appearance, swelling of the breast, and dribblings from

the nipple, peculiar tastes and inclinations, paleness of countenance (which is peculiar to some women), sickness of stomach, particularly on rising in the morning. All of these are symptoms of pregnancy, but are not *positive*, as they occur from other causes.

The *positive* or sensible signs of pregnancy, are change of the abdomen, and quickening, which takes place about the fourth month. At the third month, the abdomen is

FIG. 59.

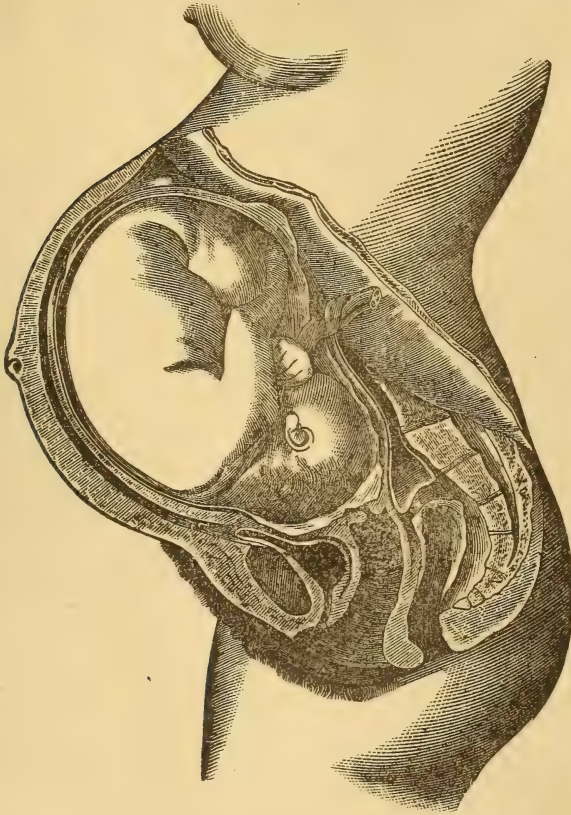


POSITION AND SIZE OF THE IMPREGNATED UTERUS OF THE PERIOD OF SIX MONTHS

slightly enlarged, by the uterus pressing back the intestines. At the fourth month the uterus rises some two or three fingers above the rim of the pelvis while at times, the motion of the child may be felt. At this period an examination per vagina may detect the child in the womb. At the end of the

fifth month there are signs that settle all doubt. The base of the uterus is now found within two fingers of the umbilicus. At the end of six months it is two inches above the

FIG. 60.



PERIOD OF NINE MONTHS WITH THE NATURAL POSITION OF THE CHILD

umbilicus; the head of the child may be felt without difficulty, as well as the action of the heart. At the end of the seventh month the uterus is still higher, and entered the

epigastric region. During the eighth month it occupies very nearly the whole of this location. At the close of the ninth month, instead of being still higher up, as might be naturally expected, it is found depressed to near the umbilical region. The child's head becoming heavier it is carried down into the pelvis. For a more tangible idea of the size and position of the womb during the various months of gestation, the reader is referred to *Figs. 57, 58, 59 and 60.*

CHAPTER XIII.

CONFINEMENT.

Assistants—The Nurse—The Room—The Bed-Clothing—
The Baby's Basket—Labor.

WITH the signs of approaching labor, pregnant women are apt to become agitated and go about preparing for a work of extreme danger. Their fears are as groundless as such preparations are unnecessary. If they have pursued regular and temperate habits of life during gestation, and have done nothing to injure their health severely, they may rely with confidence upon the resources of nature to carry them safely through their confinement. When left to herself, nature's efforts are always adapted to the constitution of the patient; and adapted to the state of those delicate and sensitive parts which would suffer grave injury from sudden or ill-timed violence. All that is required of woman in labor, is a patient waiting on the course of nature's operations. The steps of advancement are sometimes slow, but are safe and cannot be hurried or disturbed with impunity. It is particularly true in child-birth that those who are most patient usually suffer the least.

Nature has, from the hour of the mother's own birth, been fitting her for the duties and the strains of child-birth. The wonderful life power which has developed her organism and has developed the child within her womb so regularly and without error, is fully equal to the completion of its task. A power which has shown such capabilities through the years of her life and the months of pregnancy, cannot be expected to fail in the last hours needed to finish the work it has thus far carried on so well.

The great majority of labors are perfectly natural and require no aid whatsoever beyond merely watching, timely encouragement, the removal of the child and the care of the mother after delivery has occurred. Out of twenty thousand confinements, not three hundred will need any material aid; and those who need aid at all, will need very little beside simple and harmless assistance. Very few cases present any embarrassing perplexities; and while medical attendance is a most proper precaution, the woman should understand that the liability of anything "going wrong" is extremely limited.

ASSISTANTS.

The assistants of the lying-in room should be as few as possible. The attending physician, the nurse and one female friend, are sufficient. More would be in the way. Quietness and composure are to be preferred far above the noisy and inconsiderate language so often indulged in by a crowd of friends. And, besides, the noxiousness of the breath and perspiration of several persons in a close room are contrary to all laws of hygiene and cleanliness. It is true that many cases of "child-bed fever" could be avoided were greater precautions taken to render the lying-in room as clean as possible and absolutely free from disease germs.

A lady will consult her own interests best by advising her physician beforehand as to the probable time when his or her services will be required. The physician should, if possible, be one with whom the lady is familiar, of calm mind and gentle manner, in whom she can place the utmost confidence. This is a matter of the greatest importance.

THE NURSE.

A really good nurse is often very difficult to procure; for too many of them are quite ignorant or too opinionated; and

as their duties extend to the child as well as the mother, and continue for many days after confinement, they perform an important part. In the cities and good-sized towns, trained nurses, of experience and education may be obtained, who can be trusted in every particular. A good nurse should be healthy, strong, very quiet, calm, not nervous and not given too much to loud talking. A nurse of strong "self-conceit" is very apt to insist upon having her own way at sometime when that way may be very harmful to the mother or the child. She will be apt to disobey the physician's orders or add some of her own plans to them; and thus work mischief when he alone is responsible. No such nurse should ever be employed especially during confinement. It is better to pay a high price and secure a competent nurse, than to save money at the expense of the welfare of mother and child.

THE ROOMS.

It is important that the room where confinement occurs should be in a quiet part of the house, light and capable of good ventilation. It should be kept at a temperature of about 74 degrees, F. and the windows provided with blinds for shading, when that is necessary. Always select a room that has an abundance of sunshine for a part of the day. Have the room thoroughly cleaned and the floor free from all dust. A bare floor of oiled wood, with just a few small mats scattered about, is best.

THE BED.

Whatever kind of bed is used, the mattress should be very clean and firm. A feather mattress is unhealthful and inconvenient. The bed should not be in a corner, but should be so placed that the attendant may be on either side. Some prefer a single bed, while others think that a double bed is

best, so that after delivery the patient may be placed on the clean side without trouble while the soiled bed-clothing is being removed.

The arrangement of the bed-clothing for convenience is a matter of importance and should not be left until the last moment. Directly on top of the mattress place a folded quilt or comfort (on one side of the bed) and over it place a folded sheet and over this spread a piece of table oil cloth or piece of rubber cloth about a yard and a half square. Over this spread another doubled quilt, upon which the patient is to lie. This upper quilt or comfort is to receive the fluids and discharges, and is to be removed immediately after labor is completed and another quilt is to replace it.

CLOTHING.

All clothing and bedding should be taken out of the drawers and well aired before the day of confinement. Provide a half sheet for bandage, one or two extra sheets, blankets, quilts and pillow cases. Three or four towels, plenty of warm water, castile soap, sponge, pot of vaseline, scissors and silk thread, also a soft old linen handkerchief, besides the baby's clothing. Under the bed, place a chamber vessel. The dress of the woman should be light and moderately warm. She should not have drawers, but may keep on her stockings without garters, if the weather is cool. Besides the ordinary undershirt, she may have on a woolen petticoat, fastened loosely and over this a loose gown, unbuttoned at the neck. This is a suitable outfit when labor commences.

THE BABY'S BASKET.

This should contain: Castile soap, two soft towels, talcum powder, vaseline, old linen for the navel, roll of tape, a flan-

nel belly-band, undershirt, petticoat, slip, two or three diapers, paper of pins, half dozen large safety pins, one dozen small safety pins, a flannel shawl.

OF LABOR.

Labor is divided according to the period in which it occurs.

If it takes place before the fifteenth day, it is called *afflux*. Before the fourth month, *abortion*. Between the fourth and seven months, *miscarriage*. From the seventh to the ninth month, *premature labor*. At nine months, it is *natural labor*.

SYMPTOMS OF LABOR.

These are divided into two heads:

1. Those symptoms which indicate labor.
2. Those when the process of labor has commenced.

a. SYMPTOMS OF APPROACHING LABOR.—About the middle of the eighth month, the uterus has attained its height in the abdomen. Two weeks later it has decreased or fallen back or down to where it was at the beginning of the eighth month. Sometimes this diminution is sudden, occurring in one or two nights, so that the female is surprised to find herself so much smaller on rising in the morning. This diminution is occasioned by the slow and passive contraction of the uterus, and is regarded as a favorable symptom. It is common for females to remark, under such circumstances, that they feel much lighter and more active than for several weeks previous.

Another evidence of the approach of labor, is a relaxation of the vagina and external organs of generation, with an increased moisture in and about the parts. These symptoms are favorable, and indicate that Nature is preparing for the process of parturation. A strong indication of approaching labor, also, is anxiety and fidgetiness.

b.—SYMPTOMS THAT LABOR HAS COMMENCED.—There is frequent inclination to pass urine and fæces, owing to the irritation of the bladder and rectum, as a result of a sympathy between them by their nervous connections. Sometimes the desire to urinate occurs every ten or fifteen minutes. This cannot be obviated by remedies. When the neck of the uterus, however, is sufficiently dilated for the head to occupy the cavity of the pelvis, these symptoms subside.

Nausea and vomiting are also symptoms of the commencement of labor. They are to be regarded as favorable.

Sometimes at the commencement of labor, there will be a chilliness sufficient to cause the teeth to chatter and the bed to shake. This is also occasioned by the dilatation of the os uteri. When this is accomplished, the chilliness subsides. All that is necessary to be done is to add a blanket or two to the body or bed.

Another symptom is a discharge of a glazy substance from the vagina, called by nurses the *show*. This discharge is a mixture of the mucous secretions of the neck of the uterus and the lining membrane of the vagina with a little blood that exudes from the vessels of the os uteri. It may make its appearance either with or without pain.

The most prominent symptoms of labor are the appearance of labor-pains which are occasioned by the contraction of the muscular tissue of the uterus. The fœtus, after it has matured and become fitted for an independent existence, may be viewed as a ripe fruit upon the stem. As such it is placed in the position of a foreign body to the uterus, or as food to the alimentary canal. In the same manner as food is propelled outward by peristaltic contractions so is the fœtus ejected by a series of peristaltic contractions of the muscular tissues of the uterus.

The pain is occasioned by the sensitiveness of the uterus—increased by the contraction and pressure of the child against the resisting os uteri and by the dilatation or enlargement of the vagina during the passage of the child. The pain is



A FANTASY.

“Tell me, where is fancy bred—
In the heart, or in the head?”



WOMAN'S GLORY—HER HAIR.

“ 'Twas a beautiful mist hanging down to your wrist,
'Twas a thing to be jewelled and petted and kissed,
'Twas the loveliest hair in the world, my pet.”

Old Song.

proportionate to the tonicity or resistance of the uterus. In some instances, it is so enlarged, that the child is nearly born before labor pains are experienced. In other cases the pain is from the commencement to the termination of labor. In the first instances, only a slight contraction is necessary to overcome the relaxation of the os uteri; while a series of powerful contractions are required in the latter. Labor pains are sometimes modified by inhalations of ether or chloroform.

Labor pains are different from ordinary pains. They are of a *grinding* or *cutting* character, and responded to by a moaning or grumbling noise on the part of the patient. During the pain the female supports herself in some way, and bears down with some degree of force. On the dilatation of the os uteri, and when a portion of the child is passed into the vagina, the pains become of a more *forcing* character causing the patient to hold her breath and assist in the effort for its expulsion. When the child's head is pressing forcibly against the perineum, and is about to be delivered, the bearing down and pain is often very strong and acute.

Spurious Pains.—Toward the latter end of gestation there are pains in the loins and bowels, resembling labor pains, but not connected with the uterine action. These are called false or spurious pains. They are occasioned by spasmodic action of the diaphragm and abdominal muscle, causing the female to bear down and imagine that she has labor pains.

Sometimes during these pains there is considerable discharge from the glands of the os uteri or vagina; or there may be a sudden gush of urine, causing the female to think the membranes have bursted and that the liquor amnii has been discharged.

Spurious pains may continue at intervals for weeks before the commencement of labor. They generally occur at night, and thus annoy the patient and prevent sleep. It is important to be able to distinguish spurious pains and arrest them.

Diagnosis of False Pains.—They are irregular in their return and duration, and usually confined to the abdomen and

the muscles of the back; while *true* pains commence in the lower part of the loins and extend to the abdomen and thighs. False pains continually shift from the back to the sides or some part of the abdomen. True pains, at the commencement of labor, are weak, of short duration, and the intervals long between; they increase in frequency as labor progresses. True pains may also be distinguished by placing the hand over the abdomen. The structure will then become firmer, harder and denser with every pain. This will not always be the case; for the contraction of the uterine walls may be so slow and gradual as not to be felt by the hand. All doubts, however, may be settled by an examination *per vaginam*. If the examination be made, and the os uteri be found slightly open; or if the edges are stretched like a cord, or the membranes are tense and pressed down during each pain, and again relax after the pain subside, all this will be a sure indication of true labor-pains.

On the contrary, if the os uteri be completely closed and remain so during the pain and bearing down, it will indicate false pains.

If there be any doubt in the matter, it may be settled by an examination of the abdomen and os uteri. If this be not done, unnecessary trouble, watching, and loss of rest, may exhaust the patience and strength of the patient.

Spurious pains frequently mislead the physician, and cause him a large amount of unnecessary delay and trouble. When he can decide that they are spurious, he should at once set about removing them, in order to prevent the strength of the patient becoming exhausted by them.

Treatment.—The position that is most comfortable should be taken. If the bowels are constipated, they should be opened by purgative medicines, or an enemata prepared as follows:

Water, lukewarm.....	1 pint
Common salt.....	1 teaspoonful
Common molasses.....	2 tablespoonsful

Mix together and inject.

Should there be pain in the back, thighs, and abdomen, a liniment may be applied with the hand—care being taken in rubbing it over the abdomen, as friction over the uterus tends to bring on contraction.

LABOR.

Labor is usually divided into several classes, each class being again divided. The most simple classification that can be given is the following:—

a. NATURAL.—This is when the child's head presents, and delivery is effected in twenty-four hours from the commencement of labor.

b. DIFFICULT.—The head also presents, but the time is extended. In some cases instruments will be required to deliver the child.

c. PRETERNATURAL.—This form of labor includes those cases where some part of the body presents, and not the head. The presentation may be feet, knees, breech, back, belly, side, shoulder, arm, or hand.

d. COMPLEX.—This class of labor embraces all of the foregoing presentations, or where there are complicated and embarrassing circumstances, such as hemorrhage, convulsions, fainting, rupture of the bladder, or uterus, etc.

It is not the object of this work to instruct in all the details of labor—neither would it be necessary, if space permitted. The female should always employ some skillful surgeon, during the latter part of gestation, to guarantee a safe and easy delivery.

There are some cases, however, where labor is so speedy, that there is no time to procure a physician. All that will be necessary in such an emergency, is for the person in attendance to support the perineum when the child's head presses forcibly against it, and when it has passed, to sustain it until the rest of the body is delivered, which may be after one or more strong pains or efforts at expulsion. It

should also be observed that the cord is not around the child's neck, otherwise it might retard labor and jeopardize the life of the child.

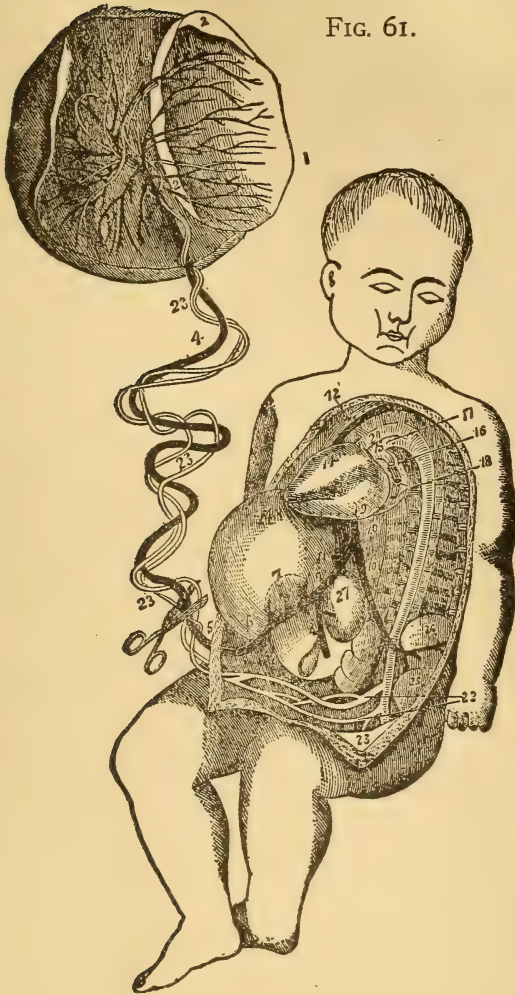
When the babe is born, it should be removed five or six inches from the mother, or to the length of the cord, without stretching it or tearing it away from its attachments, or inverting the uterus. The cord should now be tied with nine or ten strands of thread of sufficient thickness not to break, or to cut the cord in tying. If the thread be too thick, it may not compress the artery sufficient to prevent hemorrhage after the cord is cut. Two ligatures should be used—one to be tied about two inches, or three fingers breadth, from the child's navel, and secured by a double knot; the other about four inches from the child, and secured in the same way by a double knot.

The ligature is sometimes placed too near the umbilicus, which may enclose a portion of the intestine, as it sometimes protrudes in such a way. Occasionally it may be necessary to throw a second ligature around the cord, on account of the first not being drawn sufficiently tight. Having thus secured the cord in two places with two strong ligatures, the next thing to be done is to cut the cord with a pair of sharp scissors between the ligatures. (*Fig. 61.*) Care must be observed not to cut off any of the child's fingers or toes, as has been done by parties calling themselves, or considered, skillful physicians!

Two points especially are to be observed before the cord is tied. The child should breathe or cry. This will be evidence that the functions have commenced action, and that the child is capable of subsisting independent of the placental relation that existed during foetal life. The cord should cease pulsating.

Sometimes the child at birth shows no signs of life, and it may be difficult to determine whether it be dead or not. Such condition of the child may depend on pressure on the head or on the cord during labor, or it may result from loss

FIG. 61.



PLAN OF THE FOETAL CIRCULATION.

1, placenta; 2, amnion; 3, chorion; 4, 5, umbilical vein; 6, its passage through the liver; 7, its hepatic branches; 8, vena portarum; 9, ductus vonosus; 10, ascending vena cava; 11, hepatic vein; 12, descending vena cava; 13, heart turned upon its anterior side; 14, right ventricle; 15, pulmonary artery; 16, left pulmonary artery; 17, ductus arteriosus; 18, left pulmonary veins, opening to left auricle; 19, left ventricle; 20, arch of the aorta; 21, descending aorta; 22, primitive iliac arteries; 23, umbilical arteries; 24, liver turned up; 25, kidneys; 26, renal capsule; 27, lobulus spigelli.

of blood by the mother during travail or parturition. To ascertain if the babe be dead or not, place the hand over the heart. If a tremulous sensation is observed in the organ, there is a possibility of saving the child. Sometimes a few small smacks upon its buttocks are sufficient to bring forth a sob, which will end in a cry. If this should not be effectual, it should be at once placed in warm water, at the temperature of blood heat, or 98 degrees. This is often sufficient to rouse the animation of the child.

After the child has been in the water a few minutes without reviving, or if the heart seems to be growing weaker, it should immediately be taken from the warm bath, wiped dry, placed in a warm flannel or blanket, and artificial respiration attempted. The *modus operandi* of this is as follows: Press the thumb and fore-finger upon the nostril so as to close them; then place your lips to those of the child and blow the breath into its mouth and lungs. The chest is also to be compressed to expel the air thus introduced. Keep up this artificial respiration for some time, provided there be any evidence of vitality. By way of cleanliness, a piece of flannel may be spread over the child's mouth, and the breathing performed through it. If life manifests itself very slowly, the child should be rubbed with alcohol or whiskey made luke-warm. A drop or two of the liquor may also be applied to the back part of the throat or glottis with the finger. So long as there is action of the heart, we should persevere to save the child. Sometimes a dash of cold water in the face, or a slight irritant to the nostrils, will arouse the child when other more apparently vigorous means have failed. When the stupor or torpidity is overcome, a proper disposition must be made of the bantling.

Removal of the Placenta.—As a slight mismanagement in the removal of the placenta may result in injury, it will be well to leave it to the judgment of the physician. If he be not at hand, nor likely soon to be present, the hand of the nurse, or other person, should be passed over the patient's

abdomen, to ascertain if there be a second child. This being done, a reasonable time should be allowed for the uterus to expel the placenta, and not pull and jerk at it, as is too often done by the attending physician. In order to promote contraction and facilitate the expulsion of the placenta, slight friction should be made over the abdomen, particularly if there be much hemorrhage or flooding. A slight twisting of the cord and gentle traction of it, may be sufficient to bring it away from the vagina; but this must not be attempted so long as it remains in the womb, for fear of hemorrhage.

Should the placenta not come away soon after the delivery of the child, the wet cloths and napkins must be removed, and warm ones placed under the hips, while a blanket or something of the kind should be thrown over the patient to prevent a "creep" or chill, after the profuse perspiration usually concomitant of delivery. The attention of the nurse should be directed solely to the mother until the placenta is removed; nor should the physician, under any circumstances, leave the house until this is effected, and the condition of the patient ascertained.

Should the patient be weak, and there be symptoms of faintness, a little compound spirits of lavender may be administered. When the placenta has been removed, one or two warm napkins must be gently laid under the hips and between the thighs, in order to collect the sanguineous discharge, while the patient should be placed in a proper position in bed and made comfortable.

After Treatment.—When the flooding has entirely subsided, the woman's garments must be quickly changed, and herself be placed in some comfortable position, in a darkened room, to induce sleep, and kept from being disturbed by her anxious friends. The nurse, or some one accustomed to do such things, should apply a bandage to brace the bowels and give support to the abdominal muscles, in order to prevent the distress and faintness usually attendant upon the removal of the pressure of the child. The bandage also assists in

stimulating the uterus to contract and prevent hemorrhage. It should extend from the pubes to the ensiform cartilage, or to the bottom of the ribs.

It is customary to administer some medicine after delivery, with a view to quiet the nervous system and induce sleep. Some physicians are in the habit of giving large doses of laudanum. This must act injuriously by preventing the contractions of the uterus, which are necessary, in order to restore it to its former condition and to prevent hemorrhage. An excellent thing to use at this time is the valerianate of ammonia, in teaspoonful doses.

Diet.—The diet of the patient for three or four days should be of the plainest kind—such as tea, toast, or farinaceous food. On the third day, more nourishing aliment, as beef-tea or chicken broth, may be allowed, provided the bowels have been freely opened and no unfavorable symptoms have intervened. From this time the diet may be increased gradually to more substantial food.

The horizontal position should be strictly maintained for the first week. During this time she may be changed from one side of the bed to the other, in order to relieve her and adjust the couch; but she must not sit up while the bed is being made. After a week or nine days she may be up and down, as it suits her feelings, care being observed not to remain up until fatigued. In the course of two weeks or two weeks and a half, the uterus will regain its former unpregnated size, when the patient may go out of her room, still observing care not to expose herself.

INFANT AFTER BIRTH.

It is presumed that there are always females in attendance in labor, who know what should be done with the child after delivery. It will not be necessary, therefore, to go into detail in this regard. It will be sufficient to say that care should be taken to remove the secretions from the mouth and nostrils, if they are sufficient to obstruct its breathing.

CHAPTER XIV.

LACTATION.

Structure of the Breasts—Character of Milk—Signs of Good Milk—Influences on the Secretion Nursing.

WHEN delivery takes place, the functions of the genital organs cease, and the lively irritation that existed in them is transferred to the mammæ for the preservation of the child. To accomplish this, a saccharine and very nutritious fluid is secreted by the mammæ, which escapes by a slight suction of the child or by a slight titilation of the organ. This is called *Lactation*.

STRUCTURE OF MAMMAE.

At puberty in the female, the mammæ, or breasts, increase rapidly in size, and assume a firmness and plumpness, that disappear in those who have borne children and nursed their offspring.

The mammæ are composed of a number of glands with their ducts, in the centre of which they terminate in a prominence called the nipple, which is surrounded by an areolar, or a small, red or brown circle. In young females it is usually of a delicate red, but in females who have borne children it is of a brown color. The whole is covered with a thin, tender and soft skin.

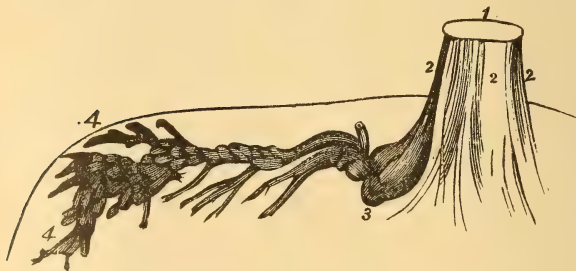
If we divide the mammæ of a female lately confined through the centre of the nipple, we will find the structure arranged in a very simple manner. The secreting portions consists of minute cells, which, when distended with milk, are no larger than the smallest pin's head, and are scarcely visible to the naked eye. They are collected into groups

from which the milk tubes arise. These tubes increase in size as they approach the nipple, by the addition of other glands, whose minute ducts terminate in them. (Fig. 62.) These ducts, as they approach the nipple, terminate in some fifteen or twenty larger ducts, and are so contracted at their orifice as only to admit a small-sized bristle. The function of these glands is to secrete milk from the blood. According to *Simon*, the lacteal secretion is composed of the following ingredients:—

Water	88.06
Caseine	3.70
Sugar	4.54
Butter	3.40
Salts, etc.....	0.30
	100.00

The milk which is secreted the first few days after child-birth is called *Colostrum*, being very different from ordinary milk, and possessing purgative properties. It is of a yellow color and viscous consistency. It contains a large amount of milk globules, which give a thick layer of cream on top

FIG. 62.



LACTIFEROUS MAMMARY GLANDS. (From Sir A. Cooper.)

1. Orifice of the nipple; 2, 2, 2, terminal extremity of lactiferous ducts of the nipple; 3, dilatation of the ducts at the base of the nipple; 4, 4, origin of the ducts in the substance of the gland.

if allowed to stand a short time. The milk, from day to day, undergoes change, and at the end of twenty-four days has passed from the condition of *Colostrum* to milk of the ordinary character.

The colostrum does not uniformly disappear in this time—in some it is earlier, and in others later. *Nasse* states that it disappears sooner in women who have borne many children than in those who have had but a single child. The persistence of the colostrum may continue in the milk without exhibiting any outward appearance, and can only be detected by the microscope and by the influence which it has upon the child, impairing its health and strength.

When the milk of the mother does not seem to agree with the child, or it fails in its health and strength without any visible cause, the milk should be examined with a microscope, and if colostrum be detected a wet-nurse should be immediately obtained. It has been observed by *Donne* that milk may entirely lose the character of colostrum and again pass into the state at any time during lactation. He has also discovered that one breast may secrete colostrum, and the other be entirely free from it. When such is the case the mother should cease nursing, as it indicates a diseased condition of the mammary glands, or a vitiated condition of her blood.

It has also been discovered that if milk be allowed to remain too long in the breasts, it becomes thin and watery. This fact is important in some cases—as when the milk is too rich, it may be allowed to remain in the breast until it becomes more adapted to the requirements of the child.

In some females, during menstruation, the milk undergoes a change by increasing the colostrum, which subsides on the cessation of the catamenial flow.

Milk is frequently found in the breasts of unmarried females, and always in pregnant women before confinement.

In all these cases it contains a large quantity of colostrum, similar to what it is after delivery. Not only is milk found

in young unmarried females, but in infants and young children of both sexes. In such cases it presents all the appearance of ordinary milk with some colostrum.

SIGNS OF GOOD MILK.

The richness and goodness of milk will depend upon the amount of globules it contains. As these globules are not distinctly visible to the naked eye the use of the microscope will best detect the quality of the milk. The opacity of the milk will indicate, in some degree, to the naked eye, the quantity of globules. Thus milk that is white and opaque is rich in globules; that which is watery and transparent is of poor quality.

The milk of the ass may be known by its watery aspect, and by its bluish tint. That of the goat by its opacity and richness. The following is an analysis of the milk of woman, the cow, the goat, and the ass:—

	Woman	Cow	Goat	Ass
Butter... ..	8.97....	2.68....	4.56....	1.29
Sugar... ..	1.20....	5.68....	9.12....	6.28
Caseine ...	1.93....	8.95....	4.38....	1.95
Water ...	87.90....	84.69....	81.94....	90.98
	<hr/>	<hr/>	<hr/>	<hr/>
	100	100	100	100

It will be seen that the milk of woman is richest in butter, while that of the ass contains the least. Butter is considered the principal ingredient of milk, which may vary very much in different females and animals. The milk of a goat is next to that of woman in respect to its nourishing qualities. This is important to be known, as goat's milk is a good substitute for the impoverished milk of a mother. It answers better than cow's milk, in containing less caseine, which disagrees with some children. A good substitute for a mother's milk is one-third of good cream and two-thirds of cow's milk

boiled together. This answers exceedingly well in marasmus, especially if a few drops of good Port wine in water be given three or four times a day to the child. In such cases, also, the child should be bathed night and morning with luke-warm whiskey.

The relative proportions of the ingredients of milk will vary very much with diet. Hence females who are nursing and have poor milk, should live on rich food, and take a glass of good beer or porter two or three times a day. Milk is sometimes wonderfully enriched by the use of chocolate and coffee, particularly the former.

Should cow's milk be selected, it should be pure and unadulterated. The milk of commerce is often sophisticated in order to give it color and opacity. The substances used for such purpose, are chalk, flour, starch, the brains of sheep and water—the latter very commonly.

A substitute for milk, that does not disagree with a babe, is a preparation recommended by Dr. Meigs of Philadelphia, namely:—To a piece of gelatine two inches square, add one pint of cold water, and let it soak for half an hour. Then add two teaspoonsful of arrow-root, three tablespoonsful of cow's milk and two of cream, with a small lump of white sugar, and let the whole come to a gentle boil. As the child increases in age and strength, the milk may be increased.

Occurrences of Medicines, Poisons, etc. in Milk.—From the rapidity with which milk is secreted from the blood, it is not surprising that chemical matters existing in the circulation of the mother should have an influence on the lacteal secretion. Medicines and various articles of food have been detected in the milk a few minutes after they had been taken into the stomach. Coloring matter, turpentine, garlic, nitrate of potash, and other salts, have been thus discovered. It is of the utmost importance for mothers and nurses to know this fact—for a purgative or narcotic is apt to affect the child more powerfully than the mother. There are many

cases on record, showing that powerful doses of medicines taken by the mother have either jeopardized or destroyed the life of the child.

INFLUENCE OF MIND ON THE SECRETIONS OF MILK.

All glandular secretions are influenced by emotions of the mind. This is noticed in the flow of saliva on thinking of food, particularly that of a savory character, or in the flow of lachrymal secretions, as in crying from excitement of the emotions, whether of joy or grief.

It is well known that the secretion of milk is increased by the mind dwelling on the offspring, and also at the sight of the infant. Strong desire to furnish milk will cause an increased flow of blood to the glands. Milk has been known to be secreted in old women, young girls, and even men, by such causes. In fact, there is no secretion of the body so easily influenced. The following case is recorded by Sir A. Cooper in his excellent work on the Breast.

“This case occurred in a robust, sanguine soldier, twenty-two years old. At the age of eighteen, he often felt a pricking sensation in his breasts, and slight periodic colic. About a year later, he observed after each occurrence of such symptoms, a slight swelling of, and a milky discharge from the mammæ; and during work, his shirt was several times wetted with the fluid. When in the hospital for acute rheumatism, a considerable quantity of milk was found to be secreted. On examining the breasts and nipples, the latter were found highly red, erectile, somewhat cracked at the apices, and much higher than in man generally, and surrounded by a somewhat darker areola through which a subjacent vascular net-work could be seen. On pressing the papillæ, two or three fine streams of milk would jet out of the minute orifices; it had a bluish-white color and a very sweet taste. The secretion was consistent, but increased at various periods, especially at night, producing somewhat painful

sensations till it was evacuated. The usual quantity was from half an ounce to an ounce daily, but sometimes not more than two or three drachms daily. On one occasion a wine glassful was drawn off, and for the fortnight that he was under observation, ten or eleven ounces were secreted. After the evacuation of it, he always said he had headache, faintness, and sometimes pain in the abdomen. Diet had no material influence over the secretion. Collected in a glass and left to stand quiet, cream soon separated, and sometimes the milk at once coagulated. After some hours' standing, the butter separated and floated at the top in yellow drops. The milk had a slightly alkaline reaction. Its specific weight was 1.024, and it contained, according to analysis, fat alcoholic extract, water, and insoluble compound."

Dr. *Louis Young*, of the West Indies, reports a similar case, which is also published in *Sir A. Cooper's* work on the Breast, viz. :—

"Although I have never witnessed an instance in which the (male) gland secreted milk, yet I have heard related a well-authenticated case which occurred at Barbadoes, in which the man was known to take the care of one of his grandchildren, to tend, nurse and suckle it as a mother, which it had lost soon after birth. The account is that the child obtained nourishment from his breasts, lived and did well."

Speaking of such secretions, *Sir A. Cooper* remarks: "The secretion of milk proceeds from a *tranquil state of the mind*. With a cheerful temper, the milk is regularly abundant and agrees well with the child. On the contrary, a *fretful temper* lessens the quantity of milk, makes it thin and serous, and causes it to disturb the child's bowels, producing intestinal fevers and much griping. *Fits of anger* produce a very irritating milk, followed by griping in the infant, with green stools. *Grief* has a great influence on lactation, and consequently upon the child. The loss of a near and dear relative, or change of fortune, will often so much diminish

the secretion of milk as to render adventitious aid necessary for the support of the child. *Anxiety of mind* diminishes the quantity and alters the quality of the milk. The reception of a letter which leaves the mind in anxious suspense, lessens the draught, and the breasts become empty. If the child be ill, and the mother is anxious respecting it, she complains to her medical attendant that she has little milk, and that her infant is griped, and has frequent green and frothy stools. *Fear* has a powerful influence on the secretion of milk. I am informed by a medical man who practices much among the poor that the apprehension of the brutal conduct of a drunken husband, will put a stop for a time to the secretion of milk. When this happens, the breasts feel knotted and hard, flaccid from the absence of milk, and that which is secreted is highly irritating, and some time elapses before a healthy secretion returns. *Terror* which is sudden, and great fear, instantly stops the secretion. A nurse was hired, and in the morning she had abundance of milk, but having to go fifty miles to the place at which the parents of the child resided, in a common diligence, the horses proved restive and the passengers were in much danger. When the nurse, who had been greatly terrified, arrived at her place, at the end of the journey, the milk had entirely disappeared, and the secretion could not be reproduced, although she was stimulated by spirits, medicines, and by the best local applications a medical man could suggest. A lady in excellent health and a good nurse, was overturned in her pony-chaise, and when she returned home and greatly alarmed, she had no milk; nor did it return and she was obliged to wean her child."

A female, a patient of the author of the present work, in 1856, was nursing a child two months old, and had more milk than the child could consume. An older child took sick, and her anxiety for it caused the milk to decrease, and in the course of a week to disappear altogether, so that she was compelled to wean her babe.



SWISS MOTHER AND BABE.

In Switzerland where the whole population are mountain climbers, the mother carries her babe in a basket strapped to her shoulders. This gives her freedom for her arms which is very essential in using the staff.



ON THE HEATH.

The influence of mental excitement may be so great as to actually poison the mammary secretions. "A carpenter fell into a quarrel with a soldier, billeted in his house, and was set upon by the latter with his drawn sword. The wife of the carpenter at first trembled from fear and terror, and then suddenly threw herself between the combatants, wrested the sword from the soldier's hand, broke it in pieces and threw it away. During the tumult, some neighbors came in and separated the men. While in this state of strong excitement, the mother took up her child from the cradle, where it lay playing and in the most perfect health, never having had a moment's illness. She gave it the breast, and in so doing sealed its fate. In a few minutes the infant left off suckling, because restless, panted and sank dead upon its mother's bosom. The physician who was instantly called in, found the child lying in the cradle, as if asleep, with its features undisturbed, but all his resources were fruitless. It was irrecoverably gone."

Carpenter gives similar cases. Two are mentioned by Mr. *Wardrop* in the *London Lancet*, No. 516. Having removed a small tumor from behind the ear of a mother, all went well, until she fell into a violent passion, and the child being suckled soon afterward, died in convulsions. Dr. *Wardrop* was sent for hastily to see another child in convulsions after taking the breast of a nurse who had just been seriously reprimanded. *Sir Richard Croft* states that he has seen similar instances. Several cases are given by *Burdach*. One was that of an infant affected with convulsions on the right side and hemiplegia on the left, from sucking immediately after its mother had met with a distressing occurrence. Another case was of a puppy seized with epileptic convulsions on sucking its mother after a fit of rage.

Carpenter, in his valuable work on Physiology, mentions two cases quite as striking as those already related, which should serve as a salutary warning to mothers not to indulge either in the exciting or depressing passions. He states in

substance that a lady had several children, none of whom had ever exhibited any tendency to cerebral disease. The youngest was a healthy infant of a few months, when she heard of the death of a child of a neighbor from acute hydrocephalus. The circumstance made a strong impression on her mind. Soon after she nursed her child, when it was seized with convulsions and died. He relates another instance, where a lady who had lost several children by convulsive disorders, who had an infant that seemed perfectly healthy in every respect. One day, in a moody frame of mind, she dwelt on the fear of losing her last infant in the way the rest had been taken away. She nursed the child while laboring under such morbid feelings, and transferred it to the arms of an attendant. Soon after it was seized with convulsions, and died almost instantly.

There may have been a predisposing cause in this latter case, but there is no doubt the immediate or *exciting* cause is referable to the mother's anxiety.

My advice to mothers has always been never to nurse a child while under the influence of mental excitements of any kind, particularly when they have lost children while nursing. I have long been satisfied that a chief cause of the excessive mortality of children under two years, is owing to the mental emotions of the mother—even more so than in that of teething, usually considered the main cause of infantile mortality. I will suppose a case:—

A mother of very susceptible disposition is nursing her child, and it is taken sick from teething or other exciting cause, the anxiety of the mother must naturally be as great an exciting cause as the one producing the disease. In this way we have fuel added to the flame, as it were, or two exciting causes operating to make "assurance doubly sure" in the death of the child, inasmuch as either is often sufficient to cause the dissolution of the offspring.

This hypothesis is sustained by the fact that sick and delicate children taken from a mother while laboring under

great anxiety or mental disturbance, and given to a wet nurse, very often recover from diseases that would have otherwise proved fatal.

The recovery, in such cases, is usually attributed to the quality of the milk. I believe it may be more reasonably attributed to the removal of the influence of the mother's mind from the infant, in the change of the nurse.

NURSING.

Nursing may be divided into *natural* and *artificial*.—Natural, is the direct application of the infant's mouth to the nipple from which it draws or derives its nourishment by the act of sucking. Artificial, is the furnishing of food to the child by artificial means.

a. NATURAL NURSING (*Fig. 63*).—Nursing by the mother requires but little teaching of the child. All that is necessary is to present the breast; the child will grasp it, and instantly there is a copious flow of milk. There is a sort of sympathy between the mother and the child—the one seeking what the other desires to give.

Some women have a great distaste for nursing, and positively refuse to do so, on account of the trouble and confinement imposed.

There is no question that it is the duty of the mother to allow her offspring to partake of the nourishment Nature has provided by the maternal font, provided her health and strength permit, and the child is not injured by the nature of the lacteal aliment. The process is equally advantageous to mother and child, in a healthy condition. It is Nature's food for the infant, and designed expressly for its further development and strength, while, as respects the mother, the drawing away of the fluid will prevent inflammation and ulceration of the glands of the breast, and drain from the pelvic and abdominal viscera the congestion usually attendant upon pregnancy. In this way many serious organic dis-

eases are avoided, which would be inevitably concomitant of any other course of procedure than the natural nursing of the babe by its mother.

Ramsbotham speaking on this subject, well remarks that "Mothers should forego the pleasures of society, give up the necessity of appearing in public, and waive even the etiquette of court, if these pleasures or that etiquette interfere in any material degree with her duties to her infant. I cannot allow that a physician would be honestly and conscientiously fulfilling the trust reposed in him, who did not, even in the highest grade of society, point out the dangers that may spring from this most natural and engaging employment being abandoned; and I would always think better of a woman's feeling, both toward her husband and her infant, who gave it the advantage of her own breast."

As before intimated, there may be circumstances which should exempt the mother from nursing her offspring. The preservation of her own health and that of her child should have paramount consideration. It is also improper to nurse during pregnancy, as is often done among women in the humbler walks of society. Many a woman nurses her child till within two or three months of a new confinement. This must not only undermine the strength of the female, but be extremely prejudicial both to the living and the yet unborn child.

The weaning of a child should be decided upon by its mother, after it has reached the twelfth or fourteenth month of its age. This is the period that Nature seems to indicate for the cessation of lactation. The milk begins about this time to diminish in quantity and deteriorate in quality; hence the child will require other nourishment besides that afforded by the maternal parent.

It is necessary sometimes to employ a stranger or wet-nurse. Great caution should be exercised in such selection—having in view what has been already said in regard to the influence of mind on the secretion of milk—the transmission

of medicines and poisons as well as constitutional vices to the child, by the nurse. We should inquire particularly about her antecedents, habits, mode of living, general health, etc. Her breast should be examined and found full and plump, while her milk should be thoroughly analyzed by some competent person, to insure its proper purity and richness, etc.

b. ARTIFICIAL NURSING.—This should resemble natural nursing as much as possible. For this purpose a glass bottle should be used, with an artificial nipple attached. The same movements of the child's lips, tongue and gums, are required to draw the milk from the bottle as from the mammæ or mother's breasts. Pure cow's milk, boiled, as already stated or other equally good substitute, should supply the place of the natural secretion.

DISEASES OF BREAST DURING LACTATION.

The breast may become diseased from various causes, and assume various forms. It will be proper here to speak only of those disorders or difficulties of the breast which are concomitant of lactation.

SORE NIPPLES.—A sore nipple generally commences in a chaf or crack, while the action of the child's mouth has a tendency to remove the skin and keep up an irritation, that will soon put on some form of ulceration and lay the foundation of a mammary abscess.

Treatment.—There are two points to be observed in treating sore nipples. One is to induce the healing process, and the other to protect them while healing.

To accomplish the former some astringent wash may be used—as alum, borax, or tannic acid dissolved in rose-water or combined in the form of an ointment. I know the constituents of this ointment and have had opportunities of judging of its effect upon all chafed and chapped surfaces. It is a valuable preparation, and should be in the possession of every mother. If the nipple is washed off once a day

with warm water and Castile soap, and the ointment applied two or three times a day, it will be all that is necessary to heal the abrasure or soreness, except protecting the nipple. This may be effectually accomplished by a nipple shield, which is capable of meeting every indication. It is a good plan to bathe the nipple a few weeks before delivery, with alum, borax, or tanic acid dissolved in rose water. It will harden the skin that covers the nipple and prevent it cracking so easily after commencing to nurse.

RETRACTED NIPPLE—In such cases the nipple is flattened on the breast, or so compressed as to produce a cup-like depression in the breast. It is generally occasioned by the foolish habit of lacing the chest when young. This practice is yet too much indulged by young ladies, for the purpose of having a small waist.

Treatment.—At birth, or before, when we find the retracted nipple, it should be drawn out by the breast-pump, before the mammæ fill with milk. Otherwise the depression may be increased. Frequent application of the breast pump prior to labor, will tend to obviate all difficulties, and enable the child to grasp the nipple. In England, there are females who hire themselves, as a special business, to suck the breast several times a day, in order to elongate the nipple, or draw it out from its retracted position.

INFLAMMATION OF THE BREAST.—This is a very common occurrence during lactation. It may be confined at first to a single gland, or it may attack the whole cellular structure of the breast. If the inflammation be allowed to continue a short time, there will be ulceration and deposit of pus.

Symptoms usually commence with fever and chills, and darting and shooting pains in the mammæ, which increase on pressure. The breast feels hard on pressure, and as the swelling increases, the skin assumes a dusky-red color. There is a throbbing which increases as the breast enlarges. This is evidence that deep-seated suppuration is taking place. This is most apt to occur in delicate females and

those of a scrofulous diathesis. After a time there is an evacuation of pus, after which the pain and inflammation gradually subsides. Inflammation of the breast is not a fatal disease, although in delicate females, where there is much and long-continued discharges of pus, it reduces the system very rapidly. As a matter of course, if the strength is not maintained, the patient may soon sink from the general debility of the system.

Causes.—The most common cause is the accumulation of milk in the lactiferous ducts, frequently induced by the mother absenting herself from her child in visiting places of amusement, etc., and not allowing the milk to be drawn off, as frequently as Nature would require to be done. It however, may result from cold or a blow upon the breast, or from mental emotion.

Treatment.—Inflammation will seldom occur unless the lactiferous ducts be allowed to become distended with milk. When any part of the glands feel hard or knotty, or painful to the touch, no time should be lost in drawing off the milk, either by applying the child to the breast or by the use of a breast-pump. No mother who is nursing should be without a good breast-pump. Sometimes in the middle of night-time the breasts may fill up and become painful, so as to require to be drawn off at once, and thus save the suffering which would otherwise have to be endured till morning. When using a pump, the hard and painful parts of the glands should be gently pressed so as to assist in forcing the milk from the duct which has become much distended.

As soon as the abscess points, it should be lanced, or the accumulated pus may break down a large portion of the gland. At the same time it relieves the pain by removing the pressure upon the nerves.

The breast should be supported during the whole process of the disease. This may be done by adhesive strips carried below and around the gland. When the gland has opened, poultices should be continued, or what will answer equally

as well, and be less cumbersome, is patent lint saturated with hot water, applied, and covered up with oiled silk.

The discharge may be so great as to require the system to be supported by tonics, and a nourishing diet.

SHOULD THE CHILD BE NURSED FROM THE DISEASED BREAST?—In order to prevent ulceration of the breast, the first point is to relieve the distended glands of the milk, according to the means or methods already indicated in the foregoing pages. After suppuration has commenced, or is likely to be extensive, or continue long, so as to affect the health of the mother, the child should not be allowed to feed even from the healthy breast, but either be given to a hired nurse or weaned. The drain of milk from one breast, and the suppurative discharge from the other is more than the generality of mothers can bear. Due circumspection must be exercised in all cases, as may be best to promote the health and comfort of both the parent and the child.

CHAPTER XV.

DISORDERS DURING PREGNANCY.

Pregnancy Natural—Nervous Disorders—Toothache—Sleeplessness—Nausea and Vomiting—Heartburn—Profuse Saliva—Intestinal Troubles—Constipation—Cramps—Colic—Disorders of Circulation—Excess of Blood—Bleeding at the Nose—Spitting of Blood—Distended Veins—Palpitation of the Heart—Shortness of Breath—Dropsy—Cough—Derangements of the Urine.

WHILE the reproduction of the species is a function wisely established by nature and wonderfully provided for in the economy of the system, the period of pregnancy nevertheless has a multitude of possible ailments. Most of these may be justly attributed to the increased sensibility of the frame, the thoughtless exposures or over-exertions of the prospective mother, or the incorrect habits of living so prevalent in society.

Very many of the disturbances peculiar to this period are quite light and some women even seem to suffer no inconvenience whatever, and in fact may be, throughout the period, in better health than usual. When there are difficulties, the system soon returns, as a rule, to its regular action by giving it the advantage of good hygienic regulations. It is quite out of place, therefore, for women to be turning to special treatment and the dosing with strong medicines for every trifling sensation that is out of the usual channel. First give scrupulous attention to the sensible rules of health, and if then serious disturbances continue, it will be time to adopt more active measures. Some annoyances and inconveniences must be endured as being naturally incident to the situation.

But it must be remembered that affliction is not a necessity, and the judicious use of proper medicines will bring much relief whenever the troubles of pregnancy become settled and annoying.

Some cautions are always necessary in using medicines during the period of gestation. For instance no sharp purgatives should be taken, such as aloes, mandrake and cathartic pills. The action of such medicines is to stimulate the lower bowels, and consequently they may affect the womb injuriously. For the same reason diarrhoea or dysentery occurring during pregnancy should be promptly checked. In short, vigorous measures of all kinds should be avoided unless circumstances demand their employment to avert more serious results.

DISORDERS OF THE NERVOUS SYSTEM.

HEADACHE.—This is a very common affliction during pregnancy. That form of it which is purely nervous generally occurs during the early months. It is of a sharp and neuralgic character, and commonly arises as part of the sympathies with the uterus. It may be provoked by strong emotions of the mind and is often associated with neuralgic pains elsewhere. It is generally relieved by two-grain asafoetida pills three times a day or five-grain tablets of guarinin. The use of phenacetine and the "bromo" compounds can not be recommended, as they should be avoided on account of their depressing after effects.

Occasionally headache occurs from pressure of blood on the brain, when there will be a sense of fullness. If there is constipation at such times, the bowels should be kept open by the use of mild laxatives or simple enemas. In all such cases frequent bathing in tepid water will give relief. If the headache should occur intermittingly it will be found beneficial to use small doses of an infusion of goldenseal.

TOOTHACHE.

Nervous women very frequently suffer from toothache during pregnancy. It is usually of a neuralgic character, and at times becomes most excruciating. If there are hollow teeth, they may be plugged with cotton saturated with various toothache remedies to no purpose. Extraction of the teeth or filling with gold or amalgam should not be thought of during pregnancy. Through the sympathetic system the nervous strain will be felt throughout the uterine organs, and may possibly result in abortion. As a rule the measures mentioned for headache will afford the most relief.

SLEEPLESSNESS.

Very few women, indeed, suffer from sleeplessness during pregnancy and those few are usually of a nervous temperament or hysterical tendency. This difficulty may possibly occur during the latter months of pregnancy and may be occasioned by close and heated room, habits of indolence or late company. Occasionally the movements of the child may be cause. Not infrequently a habit is formed of sleeping several hours during the day, and if that is the case, sleeplessness at night must not cause any concern. From eight to ten hours of sleep, out of the twenty-four should be the full limit.

In nearly every instance sleeplessness at night may be overcome by out-door exercise, good ventilation in the sleeping and living rooms and freedom from late company. If the bowels are constipated, they must be regulated. Suppers should be light and eaten at least three hours before going to bed. Very frequently sleeplessness is caused wholly by an overloaded stomach or the presence of undigested food. A tepid sponge bath, just before going to bed often produces the desired effect. If the methods of relief mentioned fail to bring easy sleep, such nervines may be used

as two-grain asafoetida pills or a teaspoonful of fluid extract of passion flower in a half cup of scalding water, sipped very hot. The use of morphine, chloral or other narcotics cannot be too severely condemned under these circumstances. They may produce sleep, it is true, but such sleep is unnatural, and weakens the body and ruins the nervous system; and may make the child liable to improper brain development. When pain or uncomfortable feelings in the abdomen cause sleeplessness, the outward application of stimulating linament will afford relief.

STOMACH TROUBLES.

NAUSEA AND VOMITING.—These troubles, already described among the signs of pregnancy, are the result of the sympathetic nervous action between the stomach and uterus. Vomiting seldom sets in until after nausea or sickness of the stomach has continued for several days. After such spells of nausea, vomiting is almost certain to follow. If it should do so, then the nausea is liable to become distressing. In some cases the patient will vomit through the day, and especially after eating. Occasionally it continues such a length of time that it causes loss of flesh and great feebleness. Marital indulgences aggravate it very much.

Treatment of nausea and vomiting during this period is often unsatisfactory, because all cases are not alike and therefore cannot all be relieved by the same measures. A first necessity is the avoidance of all foods that manifestly cause these disagreeable symptoms. Sometimes the mere fact that the stomach is empty will cause nausea, by the change of position of the womb. Such cases are relieved by eating a small bowl of light porridge or drinking a cup of hot broth before getting out of bed. In most cases, where nausea occurs during meals, or soon after, two grains of Ingluvin will give speedy relief. Pepsin preparations are often recommended. They may be useful as aids to digestion

but they do not prove of any benefit in cases of sympathetic nausea or vomiting.

We have known some of the most persistent cases of vomiting during pregnancy to be completely cured by using a half cupful of strong "oat tea," made by steeping two tablespoonfuls of ordinary oats in a pint of hot water for half an hour. This is a most simple remedy, but usually effective. In some cases lemon-juice or vinegar give relief and confections of lime-juice are good. In all cases the outward application of stimulating linament or infusion of red pepper over the abdomen will prove beneficial. Soda preparations and other alkalis should be avoided.

HEARTBURN.

This disagreeable difficulty usually appears during the latter months of pregnancy, and may prove very troublesome, but some women are troubled with it from the first month of conception. It depends upon feebleness of the digestive organs and the formation of gas from fermentation of undigested food in the stomach.

Abstinence from tea and coffee and the avoidance of articles of food known to be difficult of digestion will often put an end to heartburn. Soda and magnesia are often used to relieve this trouble; but their action is only temporary and it is never advisable to continue their use any length of time as they weaken the digestive powers of the stomach. Probably the most effective preparation to use is the essence of pepsin containing ten drops of essence of peppermint to the ounce, dose a teaspoonful, repeated in half an hour.

PROFUSE FLOW OF SALIVA.

As a rule pregnant women have an excessive flow of saliva and are constantly annoyed by a desire to spit. This is often unpleasant, but never dangerous. It seems to arise from

an acid condition of the stomach, such as causes heartburn and the treatment advised for that difficulty will usually prove beneficial. In addition, it will be good to occasionally wash out the mouth with tincture of myrrh in water.

INTESTINAL TROUBLES.

Whenever diarrhoea or dysentery occur during pregnancy they must be promptly treated, for it might make great trouble and even cause abortion, to allow the intestinal tract to become inflamed.

One of the best methods to employ is to apply stimulating linament externally over the abdomen and to take internally every hour, till relieved, a teaspoonful of neutralizing cordial (the compound syrup of rhubarb and potassa).

CONSTIPATION.

This is usually the result of pressure upon the lower bowel by the enlarging uterus, and is likely to be very troublesome during the latter months of pregnancy. Sometimes it is nearly constant throughout the entire period of gestation. Of itself it may seem to cause little inconvenience but any such tardiness in the action of the bowels may lead to loss of appetite, headache, restlessness, sleeplessness, melancholy, irritability of temper, indigestion and even severe dyspepsia, cramp colic, prostration, piles, etc. Its occurrence is thus likely to produce the derangements that will render the entire term of pregnancy a period of most unusual suffering. It is particularly important, as already advised, that no strong cathartics be used to overcome constipation.

Sometimes the inaction of the bowels will be unusually obstinate, and then there will be a strong temptation to seek the decisive removal of the difficulty by the use of violent physic or cathartic pills. This course is not justifiable, for it will not remove the cause of the difficulty and the relief will be but temporary, while serious results may follow.

If physic of any kind is used, let it be of the most mild character, such as three grains of leptandrin at bedtime or a cupful of infusion of senna containing a little ginger. Even these articles should be used quite sparingly and the chief reliance placed in the selection of a proper diet, given elsewhere, and the use of enemas. Ripe, fresh fruits of all kinds should be used with freedom and regularity, such as apples, peaches, grapes, berries, cherries, currants, pears, prunes, cranberries, etc. Unripe or unsound fruit must not be eaten, and stewed or baked articles are preferable to those eaten raw. The more succulent vegetables should also be used, as cabbage, spinach, melons, asparagus, beets, carrots, parsnips, etc. But avoid eating vegetables that cause griping or uneasiness of the bowels. Oatmeal or cornmeal porrage and graham or entire wheat bread are valuable during constipation, as well as at all other times. Vegetable soup and mutton broth are also beneficial. On the other hand white bread, crackers, cheese, beef, salted meats, preserves, plums and raspberries favor constipation.

The use of a laxative enema each morning is also a valuable measure, and a timely resort to it will prove of great benefit. A half pint of tepid water should be used at some regular morning hour, probably between 7 and 9 o'clock. This will soon cause a desire for a movement of the bowels at that time, and the enemas can then be dispensed with. But to take them at irregular times will cause the bowels to have no disposition to move until the enema is given. In obstinate cases, that will not yield to simple warm water, half a teaspoonful of powdered ginger may be added.

CRAMP COLIC.

Cramps in the legs are not uncommon at night during the latter half of pregnancy. Many also suffer much from crampings through bowels, breast and womb, causing much

uneasiness and painful "knottings" at different parts of the abdomen. A few suffer very sharp cramping and colic pains in the stomach and about the navel. These disagreeable troubles may occur at different periods of pregnancy, and come on during a day or at night, and they may become so violent as to compel the resort to various measures of relief, such as bending forward, pressure on the abdomen, etc. It is possible that such cramp may result in abortion unless the cause is removed.

In nearly every case cramps are more or less dependent upon constipation and an acrid condition of the bowels and they may be usually avoided by the use of mild laxatives and the employment of the means mentioned for constipation. When they are of a very severe character and continue in spite of overcoming constipation, more thorough measures must be adopted. It will be well to wear an abdominal supporter, which is easily obtained, and to take small doses of camomile infusion. In the evening use drink freely of an infusion of ginger, pleurisy root and lady slipper and go to bed early. A sponge bath in tepid water will be found very useful. When the cramps resemble colic stimulating linament should be applied freely over the abdomen. Great care and perseverance are required to obtain permanent relief from the crampings after they have once become frequent. The prevention of them by the methods given will be found best. To know that such troubles may arise is the surest way of avoiding them. They are not a necessary consequence of pregnancy and many women never experience them. Read the chapter on painless childbirth.

DISORDERS OF CIRCULATION AND RESPIRATION.

EXCESS OF BLOOD.—While some women become pale and thin during pregnancy, very many others get florid, have distinct fullness and hardness of the pulse, swollen veins, bleed-

ing from the nose, dizziness, ringing in the ears, etc. This is called a state of PLETHORA. It is most common after the sixth month. It used to be considered that such a condition demanded bloodletting, and the woman could not enjoy good health and a safe delivery without the use of the lancet. This notion has now passed away among the classes of intelligent physicians, as one of the absurdities of crude medical practice.

The difficulty consists not so much in an excess of blood as in an abundance of blood circulating unevenly. By directing its flow evenly through the system, the bad symptoms caused by its pressure toward the head, will abate. Warm clothing, warm foot baths, a cooling vegetable diet, drinks of whey or other diluents, and moderate exercise, will soon relieve these unpleasant feelings. All tight clothing must be replaced by loose-fitting garments and the bowels must be kept open by the methods given for constipation.

BLEEDING AT THE NOSE.—This generally affords relief to the head and need occasion no alarm. Should it become profuse, it may be checked by cold applications to the head and between the shoulders, elevation of the arms, hot foot baths, and snuffing cold water and mild astringents.

SPITTING OF BLOOD.

This rarely occurs during pregnancy except in persons of pronounced sanguine temperament or consumptives. It is a difficulty that may prove serious and should be promptly attended to. In women who are not consumptive it depends upon crowding of blood upon the lungs, usually occasioned by tight clothing and severe exposure.

The blood is of a light red color, almost scarlet, and not dark like that which is sometimes vomited from the stomach. The quantity may be very small, merely streaking some mucous spittle and indicating but little trouble. On the other hand, the quantity may be quite free, and continue

until the patient feels weak from its loss. If the lungs are small, or if there has been a cough since before conception, bleeding from the lungs becomes a matter of great concern. In such cases the patient must lie down and take active measures for relieving the lungs from pressure by inviting the blood outward. All tight clothing must be loosened at once. If the case is very urgent, three or four drops of the oiled fleabane may be given in a teaspoonful of sugar and repeated every ten minutes until other measures can be prepared. Bathe the lower extremities in quite hot water containing a little red pepper, mustard or black pepper. Cover the patient comfortably and put hot iron or jugs or water bottles to the feet and to the chest. Give every fifteen minutes a tablespoonful of strong infusion of raspberry leaves or of allspice and ginger. As soon as the surface becomes warm and moist the bleeding will cease.

To prevent to re-occurrence of bleeding from the lungs, loose and warm clothing should be worn, and strict quiet observed. Mental agitation and physical exertion must be avoided, although it is good to go abroad as much as possible. Use no coffee and drink daily some mild astringent, such as allspice or raspberry.

DISTENDED VEINS.

THE veins of the legs very often become distended with blood, which the pressure of the uterus in the latter half of pregnancy prevents from returning freely toward the heart. They become large, uneven, tortuous and knotted. During the day-time they often become greatly swollen, generally most on one side; the swelling disappears on pressure, but returns as soon as the pressure is removed. The limb is usually more or less swollen at the same time; and the breaking of some of the small blood-vessels may cause purplish-red spots and lines under the skin. It is a vexatious trouble to many women; but it is not at all serious, unless a vein

should get ruptured and then it may be very difficult to stay the bleeding.

These difficulties cannot be cured until after delivery, but they may be mitigated by lying down, wearing elastic stockings or a moderately tight bandage wrapped about the limb from the instep upward, using a light diet and keeping the liver and bowels open as advised for constipation.

Some women refuse to pay attention to these difficulties; but they usually pay for their unwise independence by suffering with varicose veins all their lives, even if they do not have an attack of inflammation of the veins or of "milk-leg" after delivery.

Should a varicose vein get ruptured, the blood may be checked by putting upon the opening some firm substance, and wrapping a bandage about the limb, so as to press the substance firmly down upon the vein. It may then be wet every hour or so with a strong infusion of oak bark or tannic acid, and the bandage and compress kept on for several days. The bandage must not be drawn so tightly as to interfere with the circulation below. Half a cupful of infusion of golden seal or hydrastis taken each day will be found beneficial in aiding the venous circulation and toning the veins.

PALPITATION OF THE HEART.

THIS is a common occurrence during pregnancy, and is probably due almost entirely from sympathetic nervous action. At times it becomes very troublesome, the heart beating so violently against the ribs as to shake the whole body, arousing the patient from sleep or causing her to stop suddenly if walking. It is often connected with hurried breathing, giddiness, ringing in the ears and disturbances of sight.

Derangements of the stomach and bowels, and strong mental emotions, are the most common causes of palpitation of the heart. It is best avoided by that course of plain diet recommended for costiveness. During the paroxysm,

the patient should lie down or sit down as may feel most agreeable to her, some persons have most unpleasant feelings of suffocation when lying down during a spell of palpitation; loosen all tight clothing and admit plenty of air. Taking long and deep and slow inspirations will be found best. When these attacks of palpitation are frequent, it is best to have close at hand the valerianate of ammonia (obtainable at any drug store) and take a teaspoonful every half hour, for three doses. Between the paroxysms, which may be several days apart, it will be well to take a two grain asafoetida pill twice a day. Refrain from the use of coffee and tea, eat a plain diet, keep the bowels regular, avoid excitement and keep the mind on pleasant thoughts. Palpitation is often annoying, but it is not dangerous, although at times very severe.

FAINING.

Some women are very liable to fainting spells during pregnancy, particularly about the time of quickening. These attacks may be provoked by very trifling circumstances, such as sudden noises, unexpectedly hearing a parson speak, a movement of the child, etc. Some grow so peculiarly sensitive that strong odors, even those that are agreeable, may cause them to faint. Sometimes the tendency to faint occurs at regular intervals, or whenever the clothing is too tight.

An attack of fainting usually comes on with sudden palpitation of the heart for a few moments, followed by paleness and unconsciousness; the lips become bloodless, breathing is feeble and the pulse nearly disappears. In from one to five minutes, breathing, pulsation, consciousness and color return, the face may become somewhat flushed and vomiting may follow.

During a fainting spell, lay the patient upon her back with the head low; loosen every tight piece of clothing about the neck and waist, admit plenty of fresh air and fan gently. Sprinkle a little cold water in the face as quickly as pos-

sible, and if the spell of unconsciousness is prolonged rub the chest with a dry, rough towel or bathe the arms, hands and lower extremities with any convenient stimulant.

After an attack of faintness, unusual care must be taken to avoid the cause which occasioned the spell. The bowels must be kept open and every precaution exercised against frights and shocks. It must not be supposed that fainting is women suffer from the spells and a direct cause can usually be ascertained. They need occasion no alarm, and fresh air and freedom of dress will be found excellent preventives.

SHORTNESS OF BREATH.

This may occur at any period of pregnancy, either from nervous irritation in the early months or from the upward pressure of the enlarged uterus in the latter months. It may become so extremely distressing as to prevent lying down without a feeling of impending suffocation. Any mental excitement, bodily fatigue or hearty eating may provoke it. During the early months of pregnancy, when dependent upon nervous sympathies, it is generally relieved by asafoetida pills,—one two-grain pill being taken at the time of distress and followed by another in twenty minutes if relief is not obtained. When pressure of the clothing causes it, then all garments must be worn looser. In all cases from stomach trouble, eat plain food and keep the bowels open, and for relief use a little essence of peppermint in water.

DROPSY.

From pressure of the uterus upon the vessels which return the blood from the lower extremities, the circulation in these parts may be much impeded and lead to a dropsical swelling of the limbs. The limbs swell, look white and feel cold, and pit on pressure, getting worse at night. The swelling begins first about the ankle and instep and rarely

gets above the knee, but in rare cases reaches the hip and abdomen. Feeble and lymphatic people are most liable to it, and it occasions little inconvenience, as a rule, beyond a sense of weight, or clumsiness in sitting or walking. But when dropsy affects the abdomen it undermines the general health and interferes with the natural advance of pregnancy.

When caused solely by uterine pressure, the weight of the womb may be supported by an abdominal supporter. The bowels should be kept open by the use of mild laxatives, and friction should be practised on the limbs. The strength should be maintained by some suitable tonic, such as peptomangan or infusion of goldenseal and ginger. Do not try to overcome dropsy by using cathartics and drugs to act upon the kidneys. They are liable to cause abortion or to greatly weaken the patient. When dropsy seems to affect the whole body then it is not dependent upon pregnancy and requires the most skillful medical treatment.

COUGH.

Very often a persistent, hacking cough may set in during the early months of pregnancy. As a rule there is very little expectoration and the paroxysms of coughing are frequent and desperately annoying. This form of cough is dependent upon sympathy with the womb, and should occasion no alarm. To obtain relief the valerianate of ammonia will be found most excellent, taken in teaspoonful doses every hour during the coughing spell. During the later months of pregnancy coughing may be caused by the enlarged uterus causing upward pressure against the lungs. This often leads to expectoration of mucus, often streaked with blood, also sore throat, headache and feverish feeling. This form of cough should always receive prompt attention. Wear loose clothing, keep the bowels open and each night bathe the feet in hot water. Stimulating liniment should be applied to the feet and to the chest night and morning and infusion of

slippery elm bark or of flaxseed should be sipped frequently to soothe the lungs and passages. Sleep in a well-ventilated room; and if the house is damp go somewhere else.

DERANGEMENTS OF THE URINE.

Some women, during pregnancy, are greatly annoyed by being unable to retain their urine, which must be discharged upon instant demand or else pass involuntarily. It is also voided very often, and usually with much scalding and itching. In the first month this arises from sympathetic irritation; but in the later months by the irritation caused by the pressure of the uterus upon the bladder.

To relieve this annoying difficulty, keep the bowels gently open and drink frequently small doses of infusion of slippery elm bark, marsh-mallow root or flax-seed. When the trouble is caused by pressure of the uterus, little can be done beside waiting for confinement, although wearing the abdominal supporter may afford relief.

Occasionally the opposite to the above condition may arise and the urine may be voided with great difficulty. If from pressure, the abdominal supporter should be worn. If from irritation, soothing relaxants, like peach leaves infusion should be used. Sometimes the catheter is required.

CHAPTER XVI.

PAINLESS CHILDBIRTH.

Childbirth a Natural Function—The use of drugs—Exercise—Bathing—The Bowels—Sleeping—Clothing.

MOTHERHOOD, woman's highest prerogative, has become her greatest dread. This is unnatural. Nature in the formation of the female organism has made every provision for the bearing of children, so that the act is strictly a physiological one, and it should incur no more danger to life than the performance of any one of the other important functions of the body. That there must be discomfort, is inevitable; for great changes cannot occur unnoticed and without disturbance; but that those changes can occur without pain and without danger, has been abundantly proven by those who have strictly obeyed physiological laws during the months of pregnancy. It is those laws that we will mention and explain in this important chapter.

Many recognize the fact that the women of savage tribes are inconvenienced and retarded in their usual duties but a few hours by the births of their children. If such untutored daughters of nature so well obey nature's laws by instinct, how much better should we, who can observe and learn from the highest intellectual standpoint, be able to avoid possible dangers.

The rules and suggestions we shall give upon this important subject of painless childbirth, may be fully depended upon. Thousands of women have been saved needless agonies by their observance. If they are followed from the beginning of pregnancy till its ending, the ending need not be dreaded. If the prospective mother does not learn them in time to commence early, she may commence late and be pro-

portionately relieved. These rules and laws are so plain that no one can fail to understand them, and they are so easily followed that no one need fail in their observance.

THE USE OF DRUGS.

It is a frightful mistake for pregnant women to resort to the use of drugs to alleviate every ache and pain that may occur. Great damage may be done by such a practice. If there is any effect produced by drugs, it is produced by affecting the nervous system or bringing about extraordinary efforts in the various organs acted upon. We want natural and not unnatural actions if we are to maintain perfect health.

It is a common practice for women to use some one of the various "headache cures" or "neuralgia cures" to relieve their uncomfortable feelings. All such preparations produce their effects by stunning the nerves and making them insensible to pain. Is that what we want when we are striving to build up the nerves for the strain that must be put upon them? Far from it. Avoid such paralyzing preparations, they are delusive and will render your nervous system weak when the time of trial arrives.

As for the use of narcotics, too often resorted to, there is no excuse except a reckless willingness to directly injure the nerves, for the sake of relieving unpleasant feelings that could have been more easily relieved by common sense methods. Laudanum, morphine, paragoric and similar narcotics must be avoided, as they are certain to weaken the nerves and increase the pain and cause danger at child-birth. In fact, women who have accustomed themselves to such drugs during pregnancy, cannot fail to experience great suffering during labor.

Another common habit, which must be avoided, is the use of soda or magnesia to correct stomach disorders that may arise. These clog up the stomach and intestines and form

products that are harmful, much as they may give relief by neutralizing the acid condition of the stomach. Observe the rules for eating and exercise given elsewhere and these stomach derangements will give very little trouble.

You may be advised to take a little "nux" as a tonic. Don't do it. That is simply the tincture of the plant from which the deadly strychnine is prepared. It is an irritating poison and will render your sensitive nerves far more sensitive. The only way in which it stimulates the nerves is by irritating them by its poisonous action.

As for the various proprietary medicines placed upon the market, with descriptions of their wonderful virtues, we would say, beware of them. They may presumably be offered "for the sake of suffering humanity," but in reality they are offered as a means of filling the manufacturers' pockets. Some of them do give relief, but in nearly every instance they give it through the use of the very drugs you wish to avoid.

If disturbances are of such a nature as to absolutely demand treatment, let the medicines employed be true remedies, harmless agents that cannot paralyze nerves or destroy structures. These are recommended in the chapters on disorders during pregnancy.

EXERCISE.

No woman can expect to have an easy labor if she fails to take plenty of systematic and healthy exercise. The blood must circulate throughout the body with natural activity and the muscles must keep firm and supple. Exercise alone can accomplish these things.

Walking, within reasonable bounds, is the most healthful form of exercise a pregnant woman can enjoy. It brings into play all the muscles of the lower extremities and develops the abdominal muscles and the pelvis and puts the ligaments in a condition to respond without difficulty to the re-

quirements of labor. It gives firmness to the muscles throughout the body. It helps the chest in expansion, allowing plenty of air to enter the lungs, which purifies the blood. It arouses and maintains the circulation, keeping the blood active and preventing sluggishness.

Open air exercise is always the best, and a walk each day throughout gestation is simply invaluable. Commence walking early and keep it up as long as possible. Be systematic in this, and if you started daily walks in the beginning of pregnancy you can continue them and enjoy them until the day of confinement.

It may be that you have not thought of this until pregnancy is far advanced. Well, then, commence walking when you do realize the benefit to be derived from it. Of course if you commence during the sixth or seventh month the walk cannot be as long at any one time without becoming tiresome. Then walk in moderation. If you cannot get out doors to walk, then walk back and forth across your room. Don't be afraid of being on your feet too much while taking this exercise. Riding is not as good as walking, but it is better than staying in-doors. It rests the mind and gives fresh air, and the motion of the carriage affords a limited amount of exercise. During and after the seventh month there is a certain risk connected with carriage riding. The jolting of the vehicle not infrequently places the child in a wrong position, or possibly causes the cord to get tangled about its neck. Where the roads are perfectly smooth and there is no probability of jarring and jolting, riding may be indulged in until the last day; but it cannot take the place of the daily walk.

The performance of household duties during pregnancy is always of advantage. The woman who secures extra help about the house so that she can take it easy will surely be far from having an easy labor. Housework is especially valuable because it keeps the mind occupied as well as the hands. Of course, excessive work is never good; it strains the mus-

cles and weakens the nervous system. But any work that a woman ordinarily performs she can perform during gestation.

In every form of exercise the breathing should be deep and regular. This requires the clothing to be loose about the body and that the mouth be kept closed as much as possible when not talking or eating.

It is healthful, non-fatiguing exercise that aids in keeping the secretions active, the lungs strong, the muscles firm and pliant and the whole body vigorous. The peasants of European countries who are accustomed to working in the field rarely experience any trouble in childbirth; but their American sisters who regard pregnancy as a disease and during the full nine months pamper themselves and lead lives of indolence, are the ones who dread childbirth instead of hailing it with delight.

BATHING.

No one can expect to maintain health without frequent bathing, and to the expectant mother it becomes an absolute necessity. It is true that not many years ago all the old style nurses and grandmothers used to believe that bathing should be prohibited for several months before confinement. But, like a great many other notions so long adhered to, this one was wholly without foundation; and practical common sense has shown it to be worse than folly.

There are many millions of pores in the skin through which impurities escape from the body; and when these pores are closed or partially obstructed, the impurities are absorbed and carried about with the blood to every part of the body, and to the unborn child itself—doing damage and making trouble everywhere.

A great aid toward insuring painless childbirth is to keep the skin in healthy action. Bathe, not merely for cleanliness, but as a means for securing the removal of impurities

through the exits Nature has provided. During pregnancy there is more than the usual amount of effete material to find its exit through the skin.

But to what extent must bathing be indulged in? Persons who have been accustomed to daily baths can, of course, indulge in them more freely than others. Under no circumstances should such persons discontinue the habit on account of pregnancy; rather should they be more free in the use of water.

First of all, provide a suitable tub for bathing. Every house should have one; but many houses have none. If you have not a stationary tub, a couple of dollars will buy a tin one of good size. If you cannot afford this, then an ordinary wash tub must answer. Several kinds of baths may be mentioned.

COLD BATH.—A great many persons accustom themselves to a cold bath every morning. This is good; but a pregnant woman not used to it cannot suddenly commence the habit. It is best to commence gradually by sponging the body rapidly, a small portion at a time, and dry thoroughly before sponging another portion. Commence with lukewarm water, and each morning use water a little cooler than was used the preceding morning; until really cold water can be used. Do not take such a bath in a cold room, and always be sure to dry thoroughly. Five minutes' time will suffice to take a cold sponge bath. It may seem a little chilly at first, but a reaction sets in almost immediately and a pleasant glow is felt all over the body. It is tonic and invigorating. Do not get into a tub of cold water, as so many imagine a cold bath implies. That might chill the surface so extensively as to retard a reaction. Only the most robust can stand such a bath; but the most delicate can soon become accustomed to the daily rapid sponging with cold water.

SITZ BATH.—This is a method of soaking the lower part of the trunk of the body in warm water, or water as hot as it can be borne. There are regular tubs constructed for this

purpose which are not expensive; but an ordinary wash-tub may be used. Tilt the tub a little and partially fill it with warm water. Sit in the tub and have the feet outside placed in an ordinary foot bath of hot water. Take care to have the body well covered with a blanket; for drafts of air or chilliness of the exposed portions of the body are not to be desired. From ten to twenty minutes may be consumed in taking an ordinary sitz bath. Always add an extra amount of hot water just before leaving the tub.

Sitz baths are most excellent for relieving the sense of weight and pain so often experienced in the pelvis. They loosen out the muscles and soothe the lower nerves and make the ligaments more pliable, so that during labor there will be no rigidity of structures to overcome. Some persons declare that daily sitz baths during pregnancy constitute the whole secret of painless childbirth. Many take the cold sponge bath in the morning and the sitz bath at bed-time. This is an excellent plan and, in conjunction with other directions given in this chapter, cannot help but insure a practically painless childbirth where no deformities exist.

For constipation, muscular soreness of the abdomen, pains in the hip joints and other discomforts in the pelvic region, the sitz baths will be found invaluable. They may be taken without any risk whatever.

HOT VAPOR BATH.—When there is inaction of the skin, which sometimes becomes almost leathery, nothing will so quickly restore it to its natural condition as a hot vapor bath. And when there is crowding of blood upon the internal organs, such a bath will be found beneficial.

An apparatus for taking a vapor bath can now be secured almost anywhere for a very small sum of money; or one will be sent by express to any part of the country by firms that manufacture them in almost every large city. The great benefit to be derived from the use of hot vapor baths or a "steam bath" is recognized now by people in general and all classes of physicians, and no hospital is considered com-

plete without its arrangements for giving them; though it is but a few years ago that the physicians who first introduced them into general practice, were ridiculed for using them and attempts were made to invoke the law against their employment.

Among the Russians and Turks these baths have long been used; and their scientific application in the treatment of disease, as originated by the Physio-Medical physicians, has been one of the greatest blessings to the afflicted.

Where no cabinet or canvas vapor bath apparatus is to be had the bath can be taken as follows: Have the bather remove all clothing and sit upon a perforated chair, adjusting a large blanket about the body in such a way as to fit snugly about the neck and spread out as much as possible on the floor. Place behind the chair under the blanket an iron or earthen cup containing about half an ordinary teacupful of alcohol. Light this alcohol and let it burn up completely. If the head feels hot, place upon it a towel wet with cold water. If there is faintness, give a little hot ginger tea to drink. It will take about twenty minutes for the amount of alcohol mentioned to burn. Weak persons should not remain in the bath half that length of time. If the skin is dry, it will be found best to place over the cup of burning alcohol a pan of hot water so that as it boils the steam will envelop the body.

You will be surprised to see the amount of bad material that can be taken from the skin by such a bath. It opens out all the pores and starts a perspiration that is of great benefit. Of course, such baths need not be taken frequently. It is of great service when a severe cold has been taken and serious trouble is threatened. Many severe spells of sickness have been averted by the timely use of the vapor bath.

Immediately after the bath rub the body thoroughly with a rough towel until the whole surface is red and then use cocoanut oil, working it into the skin on every part of the body, and giving an extra portion to the lower part of the

abdomen. This will give a wonderful sense of relief to women who "feel as though the skin would burst." And here it may be mentioned that cocoanut oil is the best oil that can be used for anointing purposes. It is quickly absorbed and nourishes the skin and is even taken up as a nourishment for the body. Life being often maintained by rubbing over the abdomen, after the stomach has absolutely refused to retain food.

THE BOWELS.

You can't expect to keep your body in a natural condition unless you pay strict attention to the regularity of the bowels. When the waste material is allowed to accumulate in the rectum, evil results are sure to follow. The putrescent gases and decomposing fluids will be absorbed and do great damage. Notice how dry and hard the discharges are when the bowels have not moved for two or three days. What has become of the fluid constituents that render the natural passages soft? They have simply been absorbed and carried around in the circulation to poison every structure they come in contact with. This is plain, common sense to everyone who will stop and reflect a moment.

Can you expect to have your unborn child thrive and develop naturally, when the blood you have poisoned enters into its circulation and is the only nourishment that it is possible for it to secure? Can you expect your own tissues to remain in the necessary condition of health while your blood is thus poisoned? Poisons of this nature always bring about one of two effects. They either irritate and cause inflammation or they stupefy the nerves by their depressant characteristics.

But there are other results of a mechanical nature that are certain to follow retention of effete material in the rectum. By reference to the plate of the organs of the body, it will be seen that the rectum is very close to the uterus or

womb; and whenever the rectum is distended pressure must be necessarily made against the womb and other pelvic organs.

How can you expect to have freedom for expansion and development of the womb with a crowded rectum pressing against it? Under such circumstances the symmetry of the womb is impaired and at childbirth, when the contractions of the womb should be regular, we will find that they are irregular, causing great pain and straining and delays that could have been avoided by forethought and attention to securing regularity of the bowels during the months of pregnancy.

Then there is another important matter in this connection. Whenever there is pressure upon the veins they become distended, because the proper flow of blood cannot be maintained through them. Overcrowding and distension of the rectum causes pressure against the adjacent veins, bringing about accumulations of blood that cause pain, often of a "dagger-like" character, about the anus during labor. This distension of the veins in these parts also softens the small blood vessels and tissues and renders hemorrhages and tearing far more likely to occur.

Again, there can be no continued pressure against the nerves in any part of the body without the nerves themselves becoming affected. As the uterus expands during pregnancy, natural provision is made for the effect of this expansion upon the nerves. Peculiar and uneasy sensations must be expected while these changes are going on; but pain of an intense character is experienced only when some unnatural pressure against the nerves is being exerted.

A crowded rectum must press against the nerves close by, and those nerves must be weakened by this continued pressure. Is it not plain that weakened nerves cause great pain when they are subjected to strains? And is it not plain that when the hour of childbirth arrives, the strain of the labor will be made more intense by the nerves being weak-

ened in consequence of previous pressure having been made upon them by the crowding of the rectum during the months of pregnancy?

You cannot fail to realize, by recounting the above mentioned facts, that constipation is a prolific source of agony during childbirth; and that free and regular, daily or twice daily movements of the bowels, during pregnancy, will work wonders in aid of bringing about painless childbirth. Knowing these things you will be able to avoid much of the misery experienced by mothers who were not fortunate enough to realize their importance. Many will tell you that you must expect to suffer from constipation during pregnancy, and the same persons will also tell you that you must expect to suffer excruciating agony at the time of childbirth. But you need not *expect* anything of the kind. It is true that there is always a tendency to constipation as the womb enlarges and presses against the rectum; and this tendency must be guarded against.

Keep the bowels free and regular in their performance of functions; and do it physiologically; so that their action will be natural. Nature cannot be trifled with or forced during pregnancy if you wish to experience painless childbirth. Leave alone harsh cathartics, aloes, mandrake, salts, cathartic pills and the like. These things irritate the bowels and irritate the pelvic nerves and all irritations must be avoided.

Eat such foods as have a tendency to keep the bowels open; they are mentioned under the heading of "What to eat." Drink plenty of water. If there is constipation in spite of regular habits and proper eating, it must not be allowed to continue. The bowels must move every day, without fail. Visit the closet at a certain time each day and make a reasonable effort, without severe straining, to secure a passage from the bowels. If they simply will not move then inject into the rectum a pint or more of warm water and retain it as long as it can be held. If this does

not secure an evacuation, repeat the injection and put a teaspoonful of sugar in the water. Don't be afraid to use these injections. They cannot do you any harm, but they can do you a great deal of good.

An important fact in connection with this matter is regularity. Giving the bowels opportunity, at the same hour each day, to move and compelling movement at that time, by using injections if they do not act naturally, will soon accustom the bowels to naturally move at that same hour each day. Let nothing come in to interfere with this regularity. Don't let the time vary fifteen minutes.

Such regularity not only keeps the rectum sufficiently free of effete material, but it gives a rhythm of action to the pelvic muscles which is valuable. Of all aids to painless childbirth, regular and even efforts at uterine contraction are among the most valuable.

If internal remedies must be used to clear the intestinal tract, let them be simple. A teaspoonful of cascara aromatic (to be had at any drug store) or two grains of leptandrin (if the liver is at fault) taken in a capsule at bedtime, will never fail to act promptly and mildly, taken along with the observance of the other methods given.

SLEEPING.

Fully one third of the time should be devoted to sleep—good, restful sleep. The changes that are taking place in the body mean extra work throughout the organism, and extra work means strain upon the nervous system. This strain requires regular periods of rest of sufficient duration to allow the system to regain perfect repose and equilibrium.

When you go to bed, go there to sleep and for nothing else. Don't lie there and think of all the tribulations of the day and of the expected troubles of the morrow. Let such things take care of themselves. Don't count sheep jumping over a fence till you fall asleep mentally exhausted, and above all don't take narcotics to bring on false sleep.

Make up your mind that bed time means time for going to sleep and by will-power put yourself to sleep. You can do this. Simply stop thinking, close your eyes and make your mind a blank. Render yourself happily oblivious of all your surroundings and worriments. It may take a little practice to do this, but you can accomplish your purpose, so that as soon as your head touches the pillow you will realize the soothing influence of restful sleep coming over you. It is such sleep that gives perfect repose. This habit of controlling the nerves is simply invaluable to the prospective mother. It gives her a power over herself that can be used to the greatest advantage in the hour of childbirth. At that time random efforts and an uncontrollable mind means pain and delay. We have seen women in childbirth who had practiced control of themselves in the matter of sleep, and between the efforts of labor they were enabled to take short and refreshing naps. Not the sleep of exhaustion, but the natural sleep that soothes the nerves and strengthens the body. Such women have "an easy labor" and are soon through the "ordeal" and "get up" without any sense of fatigue. By all means accustom yourself to going to sleep when you go to bed.

In some cases the hours of sleep at night may not afford sufficient rest; then take a nap during the day time. But always make your hours of retiring and rising systematic and take your nap at a certain time each afternoon. As in everything else, regularity of sleep is important.

Don't oversleep. Some pregnant women make it a habit to lie in bed half the morning. That is a mistake. The old maxim holds good, "early to bed and early to rise." Too much sleep softens the muscles and enervates the system and takes away the vigor of the body. The sleep of indolence is never refreshing.

Don't sleep on feathers. They overheat the body and take away the essential elasticity of the skin. They are debilitating and will deprive the muscles of that firmness

which helps the speedy accomplishment of labor. A good new hair mattress well aired every day makes the best bed for any one.

Avoid covering that is too heavy. Sleeping between blankets gives warmth without too much weight to burden the body.

Have the sleeping room well aired during the day and well ventilated at night; but never sleep in a draft. Don't darken the room while it is possible for daylight to enter and never sleep in a room that cannot get a good share of sunshine directly into it.

Sunlight is necessary to purify the air and pure air is essential for the purification of the body. If some other member of the family has a better room to sleep in than your own, manage to take that room and let the other member take yours. You must do everything in your power for the well-being of your coming child; and if you are to experience a painless childbirth you must do everything that will put your body in as natural a condition as possible. Good sleep, on a proper bed, in a clean room, well ventilated and purified by sunlight will give strength to the nerves and body, remove impurities and purify and enrich the blood.

CLOTHING.

The prospective mother who desires a painless childbirth must be sensible about her clothing. Make no attempt to alter the form by tight-fitting clothes and corsets and compressors. Such a practice means future trouble when you least desire it.

We have seen women in torture during labor whom we knew brought about their sufferings almost entirely by their efforts to "hide themselves." No greater error was ever made by pregnant women. A woman who compresses her abdomen or pinches her ribs during the period of gestation will inevitably suffer.

There are loosely flowing gowns and dresses that can be

worn most appropriately. These will leave the body perfect freedom for development and present no unsightly appearance. A little ingenuity and little extra expense will enable a woman of tact to contrive methods of dressing well that will not interfere with her condition.

Dress comfortably. If in summer, too warm clothing will prove uncomfortable and weakening and keep the tissues too relaxed, so that the muscular efforts during labor will not be strong enough, and expulsion will be delayed. If in winter, keep warm. If any part of the body is chilled the blood is driven from that part to the most sensitive of the internal organs. During pregnancy the womb and its appendages, with their crowded and dilated blood vessels are most sensitive; so that at that time chilling of the surface will prove injurious to the mother and weaken the pelvic organs and pave the way for pain and delay at childbirth.

Keep the feet and lower limbs especially warm. Cold and damp feet must not be thought of. Never mind how clumsy the shoes may look, have them with thick soles and well protected uppers, and always wear stockings that will keep the legs warm and protected against drafts.

Don't make the waist-bands of skirts and dresses tight, no matter how inconvenient you may imagine suspenders may be. A constriction about the waist means just so much more of future pain and discomfort. Contrive some means of holding up the skirts and other garments otherwise than by bands.

Some women invariably wear flannel next to the skin during pregnancy. This is a good plan for those who can stand it. But all persons cannot do so. With some the itching caused by flannel underclothes worn next to the skin is unendurable. If the season is cold woolen underclothes should be worn, even if thin linen garments are necessary underneath them.

The endeavor must always be to keep the surface of the

body from being chilled and to equalize the circulation of blood everywhere. Do not let too much blood flow to the head and upper part of the body while the feet and lower extremities are cold. In windy weather be sure that the head is sufficiently covered to keep drafts from blowing over the ears and neck so as to avoid neuralgia. A woman who suffers from neuralgia during gestation is liable to have a painful labor.

Adapt the clothing, not only to the season, but to the changes of the weather and the time of day or night. It may seem troublesome to change the clothes frequently or to put on an extra wrap or a heavier cloak just to run across the street or to do some out-door errand; but it will pay you to do so. These little things properly observed, will help you in the time of trial.

Never let the following of fashion lead you into trouble, and do not permit false modesty to tempt you to do those things which you know to be injurious. Think of your own welfare first and appearances afterward.

CHAPTER XVII.

THE CHANGE OF LIFE.

Menopause—Climacteric—Peculiar Cases—A . Natural Change—Physical Changes—Ovarian Changes—First Signs of the Menopause—Flashes of Heat—Resemblance to Pregnancy—Irritability—Few Deaths—Discomforts Expected—Possible Diseases—Sexual Desire—Controlling Influences—A Word to Husbands—Disorders During Change of Life—Mental Disturbances—Melancholy—Obscene and Lascivious Thoughts—Loss of Appetite—Excitability and Volubility—Consumption and Cancer—Neuralgia—General Management

THE period of the disappearance of menstruation is far more uncertain than that of its commencement. As a rule menstruation continues from thirty to thirty-five years; so that a woman who began to menstruate at thirteen years of age will in all probability cease to do so between forty-three and forty-eight. But there are a great many exceptions to the rule. Usually the activity of the ovarian function is prolonged in life in direct ratio to the volume of the ovaries and the precocity of ovulation. Thus the girl who commences to menstruate at twelve, being well developed at that time, will probably continue to menstruate till fifty or even longer; while the girl who did not commence to menstruate till eighteen or twenty, on account of feeble development and small energy of the generative organs, will likely cease to menstruate at forty.

There are a great many departures from the rules that are perhaps more apparent than real. For instance, it is almost universally believed that activity of the ovaries or periodical ovulation must always be accompanied by a sanguin-

eous discharge. This is not necessarily true, for it has been proven that often for a year or two before the sanguineous discharge the essential motive of menstruation may go on in the form of perfect ovulation. In substantiation of this, pregnancy has frequently occurred before any visible signs of menstruation presented themselves. Often a slight discharge of "whites" occurs at the menstrual periods for many months or even years before the regular flow makes its appearance.

For these reasons, it is sometimes difficult to ascertain the precise time at which menstruation did commence, and consequently it is confusing to try to calculate with certainty just when the "change of life" should occur in some women. Not infrequently we meet with women who have completely and permanently ceased to menstruate at forty or even thirty-five, when it can hardly be supposed that the allotted thirty years of ovulation have been completed.

In some instances menstruation has lingered till seventy and in a very few very remarkable cases it has remained even longer than that. M. Orfila, of Paris, records the case of a woman who became pregnant for the first time at the age of forty-seven, gave birth to her seventh and last child, at sixty, and continued to menstruate regularly till her ninety-ninth year. She died at the age of one hundred and fourteen. Meischer relates the case of a woman who first menstruated at twenty, gave birth to her first child at the age of forty-seven; had the flow cease at sixty-two, and re-appear at seventy-five; had it then continue till ninety-eight, stop again at one-hundred and three and re-commence at one hundred and four. In such cases the power of reproduction is not continued after the first cessation of the flow.

In some cases there are family peculiarities which pass from generation to generation. For instance, in one family for four generations definitely known, the women invariably ceased to menstruate at thirty-five and then recommenced at about forty and continued till about forty-five; but not

one member of the family was ever known to bear a child after the menstruation had re-commenced.

So universally does the menopause or change of life occur between the ages of forty and fifty years that any deviation from this rule must be regarded as exceptions and indicative of abnormal conditions. In this connection it may be well to mention that the cessation of menstruation at an early date is expected in consumptives and sufferers from cancer and other diseases that cause a drain upon the system often, also often prolonged spells of sickness such as typhoid fever, or after surgical operations involving a loss of considerable blood, the menses may cease for months. These instances are not to be considered as cases where the menopause occurred and then menstruation re-commenced. They are simply cases of amenorrhoea, described elsewhere. Again, removal of the ovaries causes a cessation of true menstruation, although not infrequently after such an operation there may continue to be regular sanguineous discharges for months or years. But of course pregnancy in such cases would be an utter impossibility.

THE MENOPAUSE IS NATURAL.

The cessation of menstruation is a perfectly natural occurrence, and is not to be dreaded as something necessarily terrible and fatal. The frame having reached that degree of solidification that would make childbearing hazardous, the functions of the uterus are completed. The menstrual flow is but the escape of material otherwise designed for the development of the fœtus, and it properly ceases when the duties of the womb are completed.

As would be naturally supposed, the changes that take place in the female organs of generation at the time of the menopause are directly opposite to the changes which occur in those organs when menstruation commences. The one is the beginning and the other is the ending of generative

ability. And yet these epochs of a woman's life have many disturbances that are very similar in character and make impressions upon the mental and physical being that often bear close resemblance. The signs of puberty have been given elsewhere, and those of the menopause or change of life, will be here described.

PHYSICAL CHANGES THAT OCCUR.

The main feature of the actual physical changes which take place in the generative organs is atrophy or shrinking of those structures. The womb becomes smaller and diminishes to the size of the uterus of a child; the Fallopian tubes diminish in diameter and become like mere perforated cords (often obliterated entirely), while the walls of the vagina shrink and lose their elasticity and vascularity. In fact the blood-vessels throughout all the pelvic organs become greatly contracted; and consequently all the pelvic tissues become anæmic, that is, they lack the blood that gives them the fullness and activity that characterizes the generative period.

OVARIAN CHANGES.

In the ovaries important changes occur. These structures grow less and less in size. The Graafian follicles gradually disappear, or if there are any of them left after the menopause it is not an easy task to find them. In some cases the ovaries become nothing more than little masses of fibrous tissue.

Externally the generative organs shrink along with the internal organs. The labia lose their color and become pale and inverted. The clitoris is almost obliterated (except in rare cases) and general atrophy or shrinking becomes a marked feature of all the tissues.

These changes occur very slowly; but when they are completed the entire generative system is reduced to a condition far less active than it was in childhood.

THE WHOLE BODY IS AFFECTED.

While such marked changes are taking place, it is but natural that the whole body should more or less share in the effects of the disturbance, for it is impossible to seriously affect one set of organs without transmitting impressions to all the others with more or less severity. It must be remembered that the sympathetic nervous system closely unites all the organs of the body, and causes the disturbances of one organ to be realized in the others. As a natural consequence, then, a woman must expect to experience many peculiar sensations during the "change of life."

In a perfectly healthy woman, who has lived according to physiological laws, the whole period of change may be passed with but slight discomfort. As a rule, women who have borne children experience less difficulty than those who have not; and women who have never married, usually have more trouble than their married sisters at this time.

The menses very seldom stop at once; although occasionally they may abruptly cease. But as a rule a year or more passes by between the first appreciable diminution of the flow and its entire cessation. In women who have always been very temperate in their habits and moderate in their feelings and indulgences, the flow may gradually diminish and disappear. More commonly, however, considerable irregularities are suffered, and the whole body undergoes various agitations, till it gets accustomed to the suppression of a discharge of such long continuance.

As the period of change approaches the flow may return a little too early each month, or it may be delayed a week or more beyond the proper time. Again, for several months there may be scarcely any appreciable flow, and then for several succeeding months the flow may be excessive and amount almost to flooding. After showing these irregularities in quantity for a few months, it may return every two or three weeks or ten days for a few times. These irregu-

larities may continue for a year or more, till finally the discharge becomes pale, then white and watery, and then ceases entirely.

As a matter of course the nervous system and the circulatory system come in for their share of disturbance. The most common experiences in connection with these are what are known as "flashes of heat," or "hot flashes." A woman may be sitting at the table or engaging in conversation, when suddenly she will exclaim, "Oh, my, I am so very warm, the room is too close, I must get a breath of air." She will rush to the door or window and get into a draft and exclaim "Whew! I almost smothered." Suddenly the "hot flashes" will pass by, and even chilliness may follow, or chilliness may precede the heat.

MAY RESEMBLE PREGNANCY.

In some instances nearly all the usual indications of pregnancy are present, and when this is the case and the menses have suddenly ceased it is often difficult, without careful examination of the organs, to assert that pregnancy is not the trouble. It is no wonder, then, that many women imagine themselves to be in this condition. The breasts may become enlarged, the abdomen may swell and the appetite become capricious. But as a rule the "morning sickness" or nausea of pregnancy is not among the disturbances of the menopause. Strong and plethoric women are liable to bleeding from the nose and rush of blood to the head, with dizziness and a burning sensation about the head and face. These symptoms are due to a rushing toward the head of that surplus blood which formerly escaped by the uterus. Such persons usually look purplish-red in the face and their eyes look reddish, while the pulse is generally full and bounding. Such women also have more or less distress about the heart and difficulty of breathing, and their sleep may be disturbed by smothering sensations or by bad dreams and sudden

awakenings. These experiences are due to a pressure of blood toward the heart and the larger blood vessels.

On the other hand, slender and delicate women may suffer extreme irritability and experience a sense of great prostration. With them, the abdomen may shrink and the breast wither away and most unpleasant mental sufferings may follow, such as melancholy, irritability, hysterical spells, and other evidences of nervous disturbances. All classes are liable to pains in the back, pelvis and loins and occasional headaches of more or less severity.

FEW WOMEN DIE FROM THESE CAUSES.

Women are usually very apprehensive while these changes are going forward. But although their sufferings are often considerable and may possibly at times become dangerous, they are always quite curable. The woman herself can control the cause of most of them, and it is a peculiar fact that fewer women than men die between the ages of forty-two and forty-nine.

Nature is so provident of her resources that she will not impose the turmoils of this period upon woman without providing adequate supplies of vitality to meet them. Those who, before the change of life comes on, and especially during the early years of menstruation, have exhausted nature by high living, intemperate excesses, relaxing and sedentary indolence, and other vicious habits, will have a much more severe and tedious time than those who have lead calm, regular and temperate lives. Yet, not many of even the most reckless will die during this period on account of the change of life itself; and the temperate and pure may confidently expect, in nature's own time, a happy termination of their annoyances.

DISCOMFORTS MUST BE EXPECTED.

Unpleasant feelings must be expected while these important changes are taking place; but nature usually com-

compensates for them all by according to the woman an after-life of superior health. If she has not previously broken down her own constitution, she now, under proper management, has before her the prospect of a good old age, with entire freedom from all her previous uterine difficulties, a good appetite, sound digestion, refreshing sleep and mental equanimity.

But, although the great majority of women pass through this trying ordeal and come out triumphant, yet it must not be concealed that there are serious maladies sometimes connected with this menstrual change and these may comprise the following :

POSSIBLE DISEASES.

1. Diseases of the nervous system, such as hallucinations, hysteria, palsy, paralysis, melancholy and general depression.

2. Ulcers on the surface, cancer, especially on the womb, and annoying skin diseases.

3. Diseases of the lungs, consumption and hemorrhages from the lungs or bowels.

4. Dyspepsia and stomach troubles and diseases of the liver and kidneys.

Any of these complications may directly arise in consequence of the menopause; but, as already stated, the dangerous complications generally occur in those whose previous lives have been filled with scenes of passion, pleasure and different kinds of excesses. From all such, exhausted nature now exacts a stern settlement for the manner in which they have been wasting their existence; and if there were no other inducement for a woman to lead a mild, prudent and restrained life, the prospect of thereby securing to herself safety and health at the decline of her menstrual period, should be sufficient.

Various physical changes throughout the body are often noticed at and after the change of life. Plethoric and full-

blooded women often become quite corpulent; and even slender women may grow quite stout and develop a full abdomen and fair sized breasts. But, again, others may grow thin and wrinkled and shriveled and sallow or waxy. In nearly all women the skin loses its former fairness and elasticity and becomes thicker and more liable to wrinkles. The voice usually becomes firmer and heavier and the mind stronger and more sedate. But it must be mentioned that women who have led lives of excessive or exhausting toil, now fall into feeble health and may acquire a peculiarly sharp voice and a remarkably perverse disposition.

Man, who has so much to enjoy from the placid and vigorous old age of his bosom companion, should see to it that her child-bearing period is not made one of wearying labor, unwholesome eating and excessive maternal duties.

SEXUAL DESIRE.

The question is often asked, Does a woman lose all sexual desire and enjoyment after her change of life? But it is a question that cannot be answered by simply yes or no. Some women declare that every vestige of sexual desire leaves with the cessation of menstruation; while others assert that the conjugal relationship is enjoyed as much or even more than formerly. It is evident that the shrunken condition of the sexual organs indicates that passion for the physical enjoyment of the sexual act is gone; but the mental enjoyment may continue, and those women who have never previously enjoyed the act from fear of conception may now actually experience greater pleasure in repeating it, when all fear is removed.

INFLUENCES CONTROLLING THE CHANGE OF LIFE.

The permanent cessation of menstruation is a natural occurrence and should, in healthy women, give no more than



THE RETURN FROM THE FIELDS.



EASTER LILIES.

the general signs of changes taking place in the organism, some of which have been mentioned. Still in this age there are but few women who are absolutely healthy in every respect.

That there are not more physically perfect women is due, not alone to their own indiscretions and mistakes, but also, and largely due, to the habits of life that are forced upon them. When we consider the routine life of womankind in all social conditions, we cannot but wonder that distress and disease so often characterize the period of her life's trial.

Take the women of society, for instance. Their rounds of "pleasures" are often periods of torture. Receptions, balls, entertainments, etc., must be attended in spite of nature's outcries for rest. It is, indeed, a common habit for society women to stifle nature's periodical functions when they interfere with society's "more important" engagements. At receptions, women stand for hours who should be reclining in quietude in their chambers. At dancing parties may be found women and young girls whirling through the dances while menstruating, wildly disregarding what their own common sense tells them they should do. And how common is it for these same women, when suffering their monthly pains and headaches, to smother them by paralyzing their nerves with some one of the treacherous "headache cures" that flood the market. Doing this in order to keep engagements and not to disappoint acquaintances by staying at home in their own privacy "just because they are unwell."

Is it any wonder that such abuse of the functional organs peculiar to women, should render them weak and easily deranged when the strain of "change" comes upon them?

It is bad enough for mature women to indulge in such abuses. But it is too true that young women, and even girls just passing through the period of puberty, follow their fashionable mothers and elder sisters in these pernicious habits. Certain it is that they should be doomed to female weak-

nesses and menstrual troubles and years of torture when the great change of life comes upon them.

But all women do not abuse their sensitive organizations by choice. The great majority of wives and mothers, who constitute the middle class, as far as worldly possessions are concerned, are compelled to disregard nature's laws governing their peculiar functional performances. Household duties must be performed, the children must be cared for and the sewing attended to, even though it is torture to be upon her feet, the wife and mother must perform her duties.

In the lower walks of life, downright abuse characterizes the habits of women. In the large factories and tailoring establishments, and shops of all kinds, girls and women dare not "lay off" at their periods of suffering, for fear of "losing a position." No matter what their physical condition they must be at their posts. Even though they might still hold their situations on the plea of "sickness," still they could not afford the loss of a single day's earnings from their small weekly wages. And we must not forget the hard-working washer-woman and the woman who works out by the day. What an army of women there are who are compelled by the demands of society or of household cares or of actual existence to do those things which in after years shall render their sufferings greater as they pass through the change of life.

A WORD TO HUSBANDS.

But there is a still greater cause of woman's needless suffering during her trying period of life, and that cause is the conduct of her own husband, who at marriage, vowed to cherish and to honor her. Millions of women in America are mere sexual slaves to their husbands' appetites. They submit their bodies to indulgences when doing so is revolting to their inclinations and an outrage to their sensitive organizations. Every man desires his wife to preserve her youthfulness as long as possible and hopes that old age will not find

her an invalid or wrinkled and cross and repulsive, yet the great majority of men are making for themselves just such future companions by habits of self-gratification regardless of the wishes of their wives who are most concerned.

And there is another important influence upon the change of life which is largely beyond the control of women and altogether within the control of their husbands. We refer to the constant mental strain so many women endure on account of the exactions and the merciless fault-findings heaped upon them. Heartaches break down the nervous system, and there is no more prolific source of suffering during the change of life than "shattered nerves."

When a woman approaches the period broken down in spirit, sad in mind and heavy-hearted from the realization that her husband has been cruel in words and actions, she cannot expect to pass easily through her trials.

Let men be men in every sense of the word. Let them use their superior physical powers, not to overpower their weaker helpmates into submission to their desires; not to assert their right to be the master; not to brow-beat and to domineer; but to tenderly protect, to love and to cherish and to deny themselves for the welfare of their faithful wives. Let men do these things and they may look forward to their wives becoming lovable companions, of whom they may be justly proud when old age comes on.

DISORDERS DURING THE CHANGE OF LIFE.

All things not being as they should be throughout woman's period of generative activity, we should not be surprised to encounter various disturbances of a most unpleasant character if not of a serious nature at the menopause or change of life. Some of these will be briefly mentioned.

MENTAL DISTURBANCES.

A despondent, gloomy state of mind, verging upon hypochondria, is not uncommon. Fretfulness over little things

that should pass unnoticed; irritability and quickness to anger about trifles; forgetfulness of perhaps important matters: indecision. These are some of the earlier signs of mental disturbances. These same peculiarities are often noticed at puberty or the commencement of menstruation, and they reappear with exaggerated force at the climacteric age or change of life.

The woman herself is generally perfectly aware of her condition; she feels acutely the distress her waywardness occasions to others; and when she is unable to control it, she will seek to hide it in seclusion until it has passed away. This is often the explanation of conduct which, to the unobservant, appears motiveless or wilful. This power of comparison, of judgment, is that which distinguishes this condition from insanity.

It is a shallow saying that woman can give no reason for what they do. They justly claim the privilege of weakness by declining to give one. They rather incur the reproach of being illogical or unreasonable, than wound their sense of delicacy. Woman's decision, then, is to be respected and not questioned.

MELANCHOLY.

One of the most aggravating conditions liable to occur at the menopause, is the condition of melancholy, varying in degree from a great sadness to a profound and overwhelming hopelessness. This form of distress is extremely liable to occur when the change of life is simultaneous with or immediately following some great bereavement. Gradually gloomy thoughts take possession of the mind, increasing little by little till thoughts of every other character are crowded out and the unfortunate woman seems to be a monomaniac, judging from the manner in which she dwells only upon the saddest ideas or facts she can conjure up. Not infrequently, while dwelling upon the past, a thought suddenly occurs that at some time long ago, the unpardon-

able sin might have been committed. This thought soon becomes a conviction and the despondent woman becomes absolutely, hopeless; abandoning herself to the idea that an eternity of torture inevitably awaits her. She next believes that others about her are in the same unpardonable condition—all destined to hades along with her—they unconscious of the fact and she alone having knowledge of it. She may harbor these ideas for a long time before imparting them in great confidence to some friend or member of the family.

Every woman who falls into such a terrible state of melancholy cannot be convinced by any argument that she is mistaken in her judgment of herself or others. Let her alone in her imaginings. Laugh at her conversation on the subject in a manner that shows her that you realize her feelings but do not share them. Then see to it that her liver is regulated and that she has plenty of pure air, good food, out-door exercise and sleep. Commonly they declare they do not sleep, but they usually get enough. Women who have led religious or literary and intellectual lives are most liable to this disorder at the change of life. It disappears in time when the change has been entirely completed.

OBSCENE AND LASCIVIOUS THOUGHTS.

Some of the most chaste and refined women may find it almost impossible to keep their minds free from obscene and lascivious thoughts during the change of life. It seems as though there were a mental reaction and evil thoughts run riot without power to control them.

In some instances women will dwell upon unclean imaginations until they believe themselves to have been participants in the vilest of actions, and then confess their imagined misdeeds to their confidential friends. As a rule these friends are able to realize that the stories do not hang together and disbelieve them and attribute them to the woman being "a little lunny."

It must not be supposed that these unusual mental conditions constitute insanity. They are, of course, indications of disturbed mental equilibrium, brought about by sympathetic action. The general weakened condition of the nerves, including the brain structure, make it impossible for the will to control the thoughts and they run at random for a while and then settle down in some one channel. They slowly change to natural thoughts as the changes in the generative organs progress and fall under control of the will when the menopause is completed.

LOSS OF APPETITE.

It is not uncommon for the appetite to fail almost completely on account of cessation of the menses. It may be supposed to result from indigestion or a weak condition of the stomach; but the tongue may be clear, although too red, and there may be no distress after eating and no other signs of indigestion. The loss of appetite is mainly due to sympathetic nervous disturbance and to exfoliation of the epithelium going on. General weakness surely follows inability to eat sufficient nourishment.

It is useless, in these cases to use pepsin and various other dyspepsia preparations. They are in no way indicated. Keep the skin freely open by frequent baths, so as to aid the elimination of impurities; keep the bowels open, and sustain the body by small quantities of concentrated nourishment. When the great change is effected, the stomach will return to its normal condition and flesh be regained.

EXCITABILITY AND VOLUBILITY.

Some women are absolutely unable to restrain their feelings or to keep from talking while passing through the change of life. The least cause for excitement will almost set them wild, and in conversation they will scarcely give

others an opportunity to speak. Such actions simply indicate a most sensitive condition of the nerve, which gradually subsides as the climacteric is reached.

CONSUMPTION AND CANCER.

It is often remarked that consumption and cancer may develop as a result of the cessation of the menses. This is an erroneous supposition. These diseases may and frequently do follow the menopause, not as a result, but because at that time the whole system is undergoing a strain; and if there is any predisposition to consumption or cancer or any other disease, it is likely to manifest itself. Persons who suspect the possible development of the troubles at this time, should take extra precautions to maintain as great a degree of health as possible by proper nourishment, fresh air, sound sleep, frequent baths and moderate exercise.

NEURALGIA.

As during pregnancy, when the relationship of the pelvic organs is being altered by the changes taking place, so during the climacteric period the nerves may become so greatly involved that severe neuralgias may occur. The attacks do not last long and may be relieved by warm outward applications. The use of narcotics in any form is not advisable in the cases. They simply weaken the nerves and make other attacks more frequent and severe.

GENERAL MANAGEMENT.

In all uncomplicated cases, to pass the change of life happily depends far more upon hygienic management than upon medical treatment. A thoughtless resort to patent medicines and strong compounds (especially purgatives and emmenagogues) is a very improper practice. The first rule of conduct should be to take no medicine whatever, unless

the symptoms of disease become unusually severe; and even then avoid all violent agents of every kind, and use only those mild and soothing articles suitable to the particular class of symptoms that may arise.

Women often drug and physic themselves into the grave, by allowing their apprehensions to overpower their judgment, and by "trying" the recipes of many well-meaning but greatly mistaken female advisers. The menopause is a critical period—a time that may be easily turned into one of great seriousness. Nature should be allowed to work out her own changes quietly and without interference, except when really necessary.

All occasions of mental excitement and agitation should be avoided; and the daily surroundings should be of that quiet and calm character favorable to mental repose. A little cheerful company is needed; but parties and much company are bad. The younger members of the family and many of the friends do not realize the cause of the apparent lack of energy and the desire to keep quiet. They argue that going about and getting into cheerful company is all that is needed and they almost force a woman to visit about and "try to enjoy herself" when she realizes that home and rest would be far better.

There should always be a moderate amount of exercise, at this time. The lighter household duties may be performed with benefit, but all heavy labor must be discontinued. Much reading, sewing and other sedentary occupations, will bring on nervousness and languor. Running the sewing machine is especially injurious. It must not be supposed that reading is to be prohibited; it is the excess that is harmful.

Women at this time should go abroad frequently and seek change of air and change of scenery. Avoid going to fashionable resorts and seek places of privacy. Those in a city should escape from it and visit the country as much as possible. The attention required by growing plants or by birds

or other pets often proves beneficial by keeping the mind from thoughts of self.

The diet should be scrupulously regular and plain. Salt and spiced meats, rich gravies and pastry, and all high seasonings and condiments, should be carefully avoided. Vegetables, ripe fruit, succulent plants and the softer class of fresh meats constitute the preferable class of foods. Coffee and tea should be used as sparingly as possible, or entirely let alone if it can be done without too great a change.

The dress should be loose and always warm; the lower extremities must be particularly well clad. Flannel or knitted woolen goods should be worn next to the skin through all but the very hottest months of the year, and in changeable climates the underclothing should be changed to meet the conditions.

The sleeping room should be well ventilated (avoiding draughts) and during the day must be well aired and plenty of sunshine admitted. A feather bed should be avoided. Slender and nervous women should be allowed all the sleep they can get; though fleshy women should retire and rise early. All sexual intercourse should be interdicted till the body has completely settled into its new condition of quietude.

Should there be costiveness, which brings on dizziness and weakness, the bowels may be regulated by eating more fruit and succulent vegetables and brown bread; or, if absolutely necessary, a warm water enema may be taken.

When there is a rush of blood to the head, warm foot baths will give relief, and when nervous feelings come on they may be quieted by tepid baths. They may be taken frequently if the after effects are agreeable. As a rule daily warm baths with gentle after-rubbing will be found most beneficial. In all that is done let temperance and moderation be the guide and strive to maintain an equable frame of mind.

By the careful observance of these measures and precautions the dreaded period will soon be passed in safety with the prospect of a hale and hearty old age.

In conclusion, let it be enjoined upon husband and friends to treat with uniform kindness and tenderness and respect the woman who is passing through this change of life. Bear with her nervousness and her fears, and exercise toward her calmness, reason, forbearance and watchful concern for her welfare.

Woman endures much. She suffers as she enters into womanhood, she suffers in maternity and throughout her sexual activity. She suffers as she finishes her generative possibilities and she deserves to safely and quietly pass through her change of life to realize a ripe old age of calm enjoyment.

CHAPTER XVIII.

OVER PRODUCTIVENESS.

RELATIVE PROPORTION OF THE MALE AND FEMALE SEXES.

THE more simple the organization of animals, the more fruitful or prolific they are. In some of the Entozoa and Mollusca, millions of ova are found. The *Aphides*, or plant lice, furnish a remarkable instance of fecundation. A single intercourse is sufficient to impregnate not only the female parent, but all her progeny down to the ninth generation. At the fifth generation a single *aphis* might be the great grandmother of 5,900,000,000 young ones. The progeny of three flesh-flies would consume a dead ox as quickly as would a lion. Nine millions of ova have been calculated to be spawned by a single codfish.

In the warm-blooded animals, the necessity of incubation or utero-gestation, places a limit to the number of animals. In the human female, the number of children is limited by reason of the time necessary for a woman to travail with each child, and the comparatively few years during which she is capable of bearing children. Many women bear children every twenty months. In some the interval is from twelve to fifteen months. Such fecundation, however, depends upon lactation, which generally prevents conception. Women usually bear a single child at a time. The proportion of twins to single children according to *Burdach*, is one to seventy or eighty. The proportion of triplets is one to six or seven thousand. Occasionally, five or six children are born at one birth.

The production of so many children at a birth, is evidence of a strong constitution in the female, and great activity in the ovaries. There must be as many ova eliminated at the

monthly period as there are children born at a birth. Over-productiveness does not depend so much on the supply of spermatozoa furnished by the male, as upon the prolific condition of the ovaries, in throwing off ova at each monthly period. It is supposed that a single spermatozoon is sufficient to impregnate each ovum or egg. If so, man, at each sexual conjunction, would be capable of impregnating many thousands of ova. Over-productiveness, therefore, when it occurs, may be attributed more to the female than to the male.

Men have been known to beget seventy or eighty children at two or more marriages. A healthy woman bearing all the time allowed her, say thirty years, and having one child every twenty months, might, accordingly, become the mother of twenty children at least. Many women have had fifteen or sixteen children—some seventeen or eighteen, or even more, as the following remarkable and well-authenticated cases will verify:

Ambrose Pare tells of a woman who had eighteen children at six births. Another authority mentions a woman who was the mother of *forty-four* children—thirty by the first husband and fourteen by the second. Another more extraordinary instance, (as related by *Fournier*,) is of a woman who had fifty-three children in one marriage. Eighteen times the births were single; five times they were twins; four times triplets; once six at a birth; and seven at another. A case is also recorded in "Good's Study of Medicine," of a woman who had fifty-seven children.

The following is a more extraordinary case than either of those above related. It occurred in Russia, and is recorded in a Russian journal. A peasant by the name of *Ririlow*, with his wife, was presented to the Empress. He was married for the second time at seventy years of age. His first wife was confined twenty-one times. Four times there were quadruplets, seven times triplets, and ten times twins, or in all fifty-seven, and all alive. His second wife

was confined seven times—once of triplets, and six times of twins—in all fifteen children; making the husband the father of seventy-two children, fifteen of whom were born to him after he was seventy years of age.

Such over-productiveness is said to be quite common among the peasantry of Russia. If so, it speaks well for the vigor of the people of that country.

The history of the case is taken from *Ramsbotham's Midwifery*.

“Margaret, wife of Herman, Earl of Henneberg, and daughter of Florence, the fourth Earl of Holland and Zealand; being about forty years old, upon Easter-day, 1276, at 9 A. M., was brought to bed of 365 children, all of which were baptized in two brazen basins by Guido, the suffragan of Utrecht. The males, how many soever there were of them, were christened John, all the daughters Elizabeth; who all, together with their mother, died on the same day, and with their mother lie buried in this church of Lousduen.” This supernatural infliction is accounted for on the principle of retributive justice, for we are informed that the Countess, being solicited for alms by a poor woman who was carrying twins shook her off with contempt, declaring that she could not have them by one father; whereupon the poor woman prayed to God to send her as many children as there were days in the whole year; “which came to pass, as is briefly recorded in this table, for perpetual recollection, testified as well by ancient manuscript as by many printed chronicles.”

AVERAGE OF MALE AND FEMALE BIRTHS:—According to *Burdach*, the proportion of children born in each marriage in England is 5-7; in Italy, 2-3; France, 4-5; Germany 6-8. Out of every fifty marriages one is unfruitful. There is on an average one birth for every twenty-five of the population of a place. Taking the population of the world at six hundred and thirty-three millions, about fifty children are born every second. In all countries where observation has ex-

tended, in the average number of births, the males exceed the females from four to twenty in one hundred. It has also been observed by *Burdach*, that the first children of a marriage consist of a greater number of females than males in the proportion of one hundred females to fifty-three males. An effort has been made to establish a data in explanation of the formation of male and female offspring; but no satisfactory law can be given in this regard. In some families, the offspring are all females, in others all males. In some only one female and the rest males and *vice versa*; and similar results running through several generations.

Some suppose that the right testicle of the male and right ovary of the female furnish a male child, and the left, or reverse, the female.

The wishes of parents have also been supposed to exert an influence at the time of conception. The character of the food used by the female at pregnancy, the use of charms, medicine, magical receipts, etc., have been supposed to exert an influence in the production of either a male or female child.

According to *Giron, Hofacker, Turingen and Saddler*, when the husband is considerably younger than the wife, the proportion is ninety sons to one hundred daughters. If the husband is considerably older than the wife, the proportion is from one hundred and fifty to one hundred and sixty sons to one hundred daughters. Intermediate ages have been found to give a proportionate scale.

Burdach states that very fruitful females bear more boys than girls, as for example:

	Boys	Girls
1st woman bore.....	26	6
2d " " in first marriage....	27	3
2d " " in second marriage...	14	0
3d " "	38	15

With our present knowledge of embryotic development, With our present knowledge of embryotic development, no rules can be laid down to insure offspring definitely of

either sex. It, however, may be here stated, that in the earlier stages of embryotic life, the sexes are perfectly alike in structure, and it is impossible to say whether the young embryo will unfold in a male or female child. The type of the sexual organs in the early part of the utero-gestation is not double as generally supposed. The influence which is exerted to develop the male or female child out of a single or common type, is yet an unfathomed mystery of Nature.

From the single type of the genital organs, it may be perceived how one side of the embryo may have the male organs developed, and on the other side those of the female. Such cases have already been given in the chapter on Hermaphroditism in the present volume. There may be also a blending of the male and female species in what is called the "Free-martin" calf—which occurs in a cow bearing two calves, one of which is a male, and the other resembling a female in respect to its external reproductive organs, while the internal apparatus is imperfect—and hence its name of hermaphrodite or "free martin."

In the reproduction of the human being, and indeed in all organized creatures of the animal or vegetable kingdoms, there is found a wonderful uniformity in Nature, in providing a relative proportion of the male and female elements of pro-creation. Every creature or thing has its mate or fellow, while it is not in the power of man to set limits to the relative amount of the male and female forces concomitant of fecundation or the law of increase.

CHAPTER XIX.

EXTRA-UTERINE PREGNANCY.

EXTRA UTERINE PREGNANCY is divided into three varieties—*Ovarian, Fallopian* and *Abdominal*.

a. OVARIAN PREGNANCY.—This is when the spermatozoa passes along the Fallopian tube, and impregnates the ovum before it has been grasped by the fimbriated portion of the tube and allowed the ova or ovum to become regularly impregnated after being detached from the ovary. The gland or ovary is thus converted into a sac, in which the ovum is imbedded and developed. *Fig. 64* shows an embryo three or four months old imbedded in such manner in the ovary.

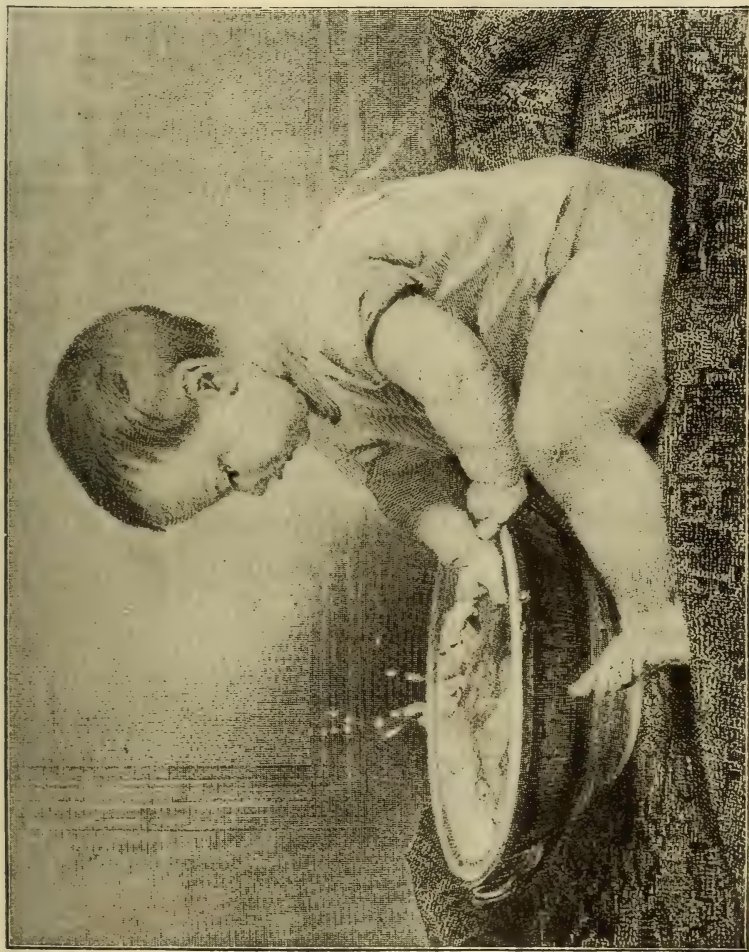
b. ABDOMINAL PREGNANCY.—In this form of pregnancy, the ovum has become impregnated after it has been received into the fimbriated extremity of the Fallopian tube, prior to being dropped into the abdominal cavity, where a vascular sac surrounds it and it undergoes development.

c. FALLOPIAN PREGNANCY.—In this species of pregnancy, the ovum, after it has become impregnated, is obstructed in its translation toward the uterus, and retained in the tube.

In either of these forms of pregnancy, the uterus will take on the same forms of preparation as if the pregnancy was natural. The deciduous membrane will form within the uterine cavity; a mucus secreted by the glands at the neck of the womb, will close the neck; while the uterus itself will sometimes increase or enlarge to two or three times its natural size.

While these extra-uterine pregnancies exist, natural pregnancy may occur from an ovum, which has passed through the tube on the opposite side of the body into the womb.

Extra-uterine pregnancy is frequently arrested before the period of nine months. The foetus will either decompose



A TEMPEST IN A WASH-BOWL.

A. J. 183.

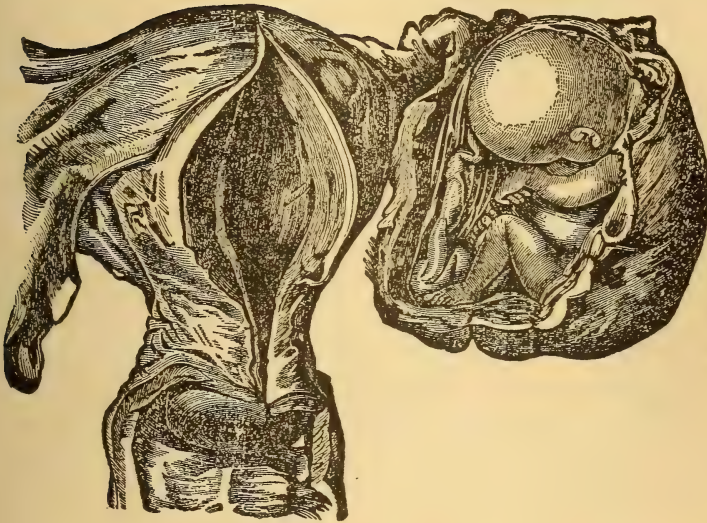


THE LITTLE HOUSEKEEPER.

Nothing charms one so much as to see a young girl helping her mother around the house.

and pass away by ulceration, or else remain for years imbedded in the part in which it is deposited. There are many instances on record where the fœtus has thus remained for a number of years in abeyance, while in the interval the female has given birth to several healthy children.

FIG. 64.



OVARIAN PREGNANCY OF THREE MONTHS.—THE EMBRYO IS IMBEDDED IN THE SUBSTANCE OF THE LEFT OVARY..

[From Ramsbotham.]

The following are examples in point:

In *Baubine's* Latin translation of Roussel, 1601, there is a history of a fœtus that had remained in the abdomen of a female twenty-eight years, and become converted into a hard earthy mass. This female died at sixty-eight. An-

other case is given in the *Hist. de l'Academie Royal des Sciences*, An. 1778, in which the fœtus remained in the abdomen for nine years. In the same publication there is another account of a fœtus, weighing eight pounds, that had remained in the abdominal cavity thirty-five years, the woman dying of pulmonary disease. Also, still another case, where a woman conceived at forty-six and died at ninety-four, in whose abdomen was found an ossified fœtus which she must have carried for forty-eight years.

In the *Medico-Chirurgical Transactions*, a case is reported of a fœtus that had remained in a woman's body for fifty-two years. In the *Edinburgh Medical and Surgical Journal* there are two similar cases presented—the one being retained twenty-six years and the other between thirty and forty years.

Campbell mentions a case where the fœtus had been retained fifty-five years. In the *Philosophical Transactions*, there are a number of cases given. One of these is of a woman, who died at eighty-four, having carried a fœtus twenty-six years, that weighed eight pounds. Another woman carried a fœtus twenty-eight years, during which time she gave birth to two healthy children. Dr. *Campbell*, in his researches, presents seventy-five cases, where the fœtus had been retained for periods varying from three months to fifty-six years.

It has been observed that at the end of nine months in extra-uterine gestation, the uterus will take on its expulsive action; all the symptoms of labor and parturition will continue for several days, and terminate in the expulsion of the deciduous membrane. The same action of the uterus will occur should the fœtus die before the natural period of gestation.

The fœtus in all of these cases, where it has remained in the cavity of the abdomen for a length of time, has been converted either into a substance resembling adipocere, or coated with a bony or earthy crust—thus preserving it for an

indefinite period, and causing no inconvenience, except its weight and bulk, to the female.

The cause has been attributed to fright during the sexual congress. This idea, however, is not sanctioned by the physiologists of the present age. It rarely occurs in married females—mostly in the unmarried, or those of irregular habits and immoral character.

CHAPTER XX.

CONGENITAL DEFORMITIES.

DISEASES OF CHILDREN PREVIOUS TO BIRTH.

FROM observation there is reason to believe that the child previous to birth may take on certain diseases existing at the time-being in the mother, communicated through some infection or other cause, or from the father to the mother and afterwards by her to the child. In this way syphilis, scrofula, small-pox, and other diseases may be communicated to the unborn child. Malformations may also result from some strong mental impression (as before intimated), or may arise from falls, blows, concussions, pressure, etc.

The investigation of this subject is not only interesting, but important, as calculated to benefit both mother and child, by pointing out the causes that produces them and the means by which they may be obviated. Were mothers made acquainted with the diseases liable to effect their children during uterine gestation, they would be enabled to avoid them, and thus save much suffering both to themselves and offspring.

The foetus is liable to arrest and change in the formative process, in the early stages of utero-gestation, through excessive action of such process; or it may result from the arrest of natural development, or from some change in parts after natural development has commenced—more generally, however, in the former than in the latter instance.

The ovum before it becomes fecundated with the male sperm, may have communicated to it some morbid taint by the mother, and hence malformation results as a consequence. It may occur from adhesion of two germs or ova, and thus give rise to anomalies, like such as is witnessed in

the "Siamese twins;" or in the more remarkable case, of which a sketch is given (*Fig. 65,*) of two children born a few years ago at Boyle, in the county Roscommon, Ireland. These were born alive and lived more than a week. After death they were procured by the College of Surgeons, Dublin.

FIG. 65.



CONGENITAL-MALFORMATION OF TWO FOETUSES.—(*From Cyclop. Anat. et Phys.*)

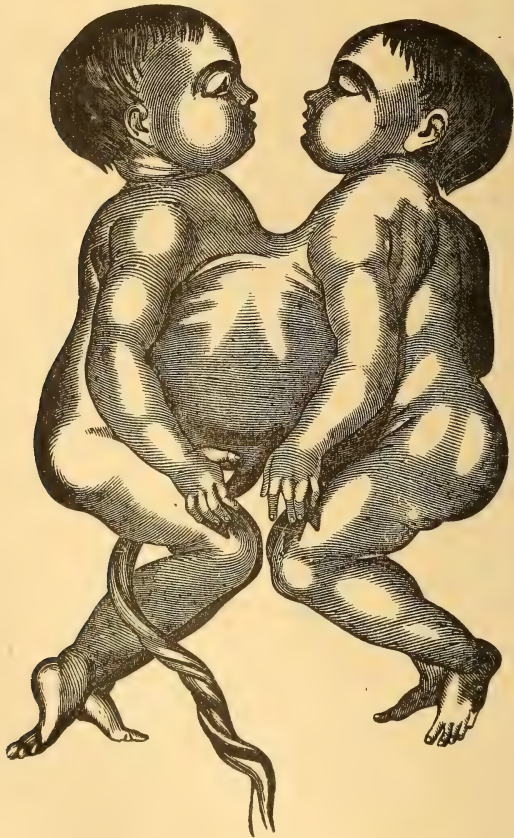
Sir E. *Home* gives an account of a case where there were two heads joined together. *Ramsbotham*, also, in his excellent work on "Midwifery," gives two cases where children were joined together by the back, sternum, abdomen, and sides, both of which subjects are preserved in the London Hospital Museum. (See *Figs. 66* and *67.*)

In some instances, such individuals live a long time. A case of this kind is that of the celebrated "Hungarian Sisters," who were exhibited in Europe during the last century. These sisters had double viscera, although but one anus. They had two vaginæ. One girl was more delicate than

the other, and while one suffered convulsions the other was well. One slept while the other was awake. When one was hungry the other was not. They died at the same instant aged twenty-two.

The Siamese twins is another example. They are connected at the lower part of the sternum by a band of only

FIG. 66.



CONGENITAL MALFORMATION OF TWO FOETUSES. (*From Ramsbotham.*)
The union occurs at the abdomen.

four inches long and ten inches in circumference. Their systems seem to act in unison. One cannot sleep without the other does. They awake from sleep at the same moment; both hunger alike and desire the same food; in short, all the functions of the duplex organisms are performed simultaneously, as if they were the functions of a single being.

FIG. 67.



CONGENITAL MALFORMATION OF TWO FOETUSES. (*From Ramsbotham.*)
The union occurs at the sternum, back and abdomen.

They married sisters, have children, and now reside on their plantation in the State of Georgia.—(*Am. Jour.* 1885.)

There are a number of cases recorded in which the body of one was only slightly developed while the other was fully formed. The Chinese boy A—KE is an example. He had the loins, upper and lower extremities of a brother attached to his umbilicus and sternum.

Ambrose Pare relates a case which was exhibited in 1550 in Paris. The individual was forty years old. He had growing upon his abdomen, a small body perfect in all its parts, excepting its head and shoulders, which were wanting.

Zachias tells of a well-formed man named *Lazarus Coloredo*, aged twenty-eight, who had a twin brother *John* hanging from his chest. *John* had a larger head than *Lazarus*, two arms, and the fingers on each hand, and was sustained by the food taken by *Lazarus*.

Many curious cases of malformation come under the notice of the hospitals and clinics connected with the various medical schools of Philadelphia. A recent instance, as reported in the "Medical and Surgical Reporter," of Philadelphia, for March 5, 1859, which received the service of *Dr. Pancoast*, at the Hospital of the Jefferson College, is of too remarkable a character to be omitted in this chapter. It was perhaps the most unique case of monstrosity on record in modern times. It was termed "*Herteradelphia*," and the operation was by the "*ecraseur*." It first came under the notice of the Professor and class on the 12th of February, 1859, the subject being brought from the western part of Pennsylvania. It was a child seven months old, having appended to its left cheek a large mass, growing more rapidly than the child itself, and containing the materials of an imperfectly formed child. Fingers were seen, and a portion of a rudimentary forearm. At birth, the tumor was about the size of an apple; at seven months, (or time when it was presented to the clinique,) it was nearly a foot long. The

intestines, then covered with skin, were at birth distinctly visible. Below the mass of the intestines was a sort of *cloaque*, which, however, had no communication with the bowels. There was a prominence resembling a penis. A *corpus cavernosum* was also felt by the finger. There was pulsation in the mass numbering from forty to one hundred beats in a minute, although they were not synchronous with the beat of the heart of the perfect child. An abscess was found in one portion of the mass, and the rosy color of the tumor, as well as the presence of a large artery, showed that it was largely supplied with blood. The buccinator muscle of the child was drawn into a mass, so that when the finger of the surgeon was passed into its mouth it passed into a tube. A peculiar caul-like membrane, pierced with holes, separated the primary child from the parasite, but its nature or office was not determined. The mass, likewise, had a liver, which was disproportionate to the size of the child. The child suffered greatly from *erythema intertrigo*, from the constant friction to which it was subjected from the parasite, although the mother afforded a constant support to the tumor with her hand.

Dr. Pancoast explained the nature of the formation of monsters, as owing to excess or defect; gave his views of cases of inclusion in which a foetus was contained within another, foetus in foetu, and detailed much important information in regard to double monsters in general. On the 19th of February an operation was decided upon, the parents having been informed of the great danger likely to be the consequence of the removal of the tumor. Dr. Pancoast believed with Dr. *Dunlison*, that the operation by the knife would be attended with an amount of hemorrhage that would probably be fatal before the child could be removed from the table. It was hence agreed to use the *ecraseur*, which, by forcing down the skin and bruising the vessels thoroughly before the chain of the instrument cuts through the mass, prevents hemorrhage.

"The application of ether as an anæsthetic agent," says the *Reporter*, "to the perfect child had the effect at once to put a stop to the pulsations going on in the parasite. Four needles were passed through the caul-like membrane, so as to get as much skin as possible from the outside of the buccinator muscle, and several threads were passed around them. The instrument was applied, and the chain rapidly worked at first until the parts were well compressed, and then very slowly. After about fifteen minutes, the tumor came away with the instrument, the chain having worked through, with scarcely a drop of blood following the removal, and but one small vessel requiring ligation. The surface left was about ten inches by about an inch and three-quarters. The tumor weighed nearly two pounds and a half."

A dissection of the mass confirmed all the facts of its being a case of foetus in foetu. The child from which it was taken was doing very well, a week after the operation; the space left in the cheek was healing up by granulation very satisfactorily, the patient being well enough to be returned to the home of his parents in the west.

This intus-susception or adhesion of one germ with another, has been frequently met with in the hen's egg, and the eggs of various animals.

The ancients attributed such malformations to Divine vengeance, witchcraft, or the influence of the devil. These opinions answered in the dark ages, but are now entirely exploded. The light of science enables modern pathologists and physiologists to explain many of the causes of such remarkable abnormal phenomena.

It is important to know that the same species of deformity may be produced in successive progression, in the same female. The first child will be the most deformed, the next less so, and finally the deformity will entirely disappear. It not unfrequently happens that the deformity of the mother is communicated to her offspring. Likewise that of the

father, though these cases are less frequent than those affecting the mother.

Ramsbotham gives two cases of this kind, in his work on "Midwifery." In the year 1831, two children were born twins. One of them had a supernumerary finger on each hand and toe on each foot; while the other had an extra finger on the right hand. The mother of these twins had similar supernumerary fingers and toes. She was the mother of twenty-one children. All the girls except one were born with extra fingers and toes; but only one of the boys was so affected. This woman's mother and sister had similar deformities.

Meckle, in his *Pathological Anatomy*, presents a variety of such singular freaks of Nature.

In the article on *Generation*, in the present work, a number of cases of defects and malformations are presented, as concomitant of the mother's mental impressions during pregnancy. These remarkable statements should be received with considerable caution. There can be no doubt that the mother does exert more or less influence upon her child during utero-gestation, as a result of the operations of her mind or mental feelings. The influence of the mind in producing diseases, and in removing them, is sufficiently well established, and it is only reasonable to suppose that similar influences might, and do, extend to the offspring while being nourished in its embryotic or fetal state.

Tiedemann attributes all malformations to some defects in the vascular or nervous system. He states that the hare-lip is owing to the absence of olfactory nerves; and malformations of the eyes to some defect in the optic nerves. Recent observations, however, do not confirm his views.

The *causes* of malformation, no doubt, are as various as are the abnormal developments, and it is scarcely possible that they can all ever be ascertained. With many of them, however, modern physiologists are sufficiently familiar, to

found a rational hypothesis as a basis for the whole, from the curious facts which have already been detailed.

There is abundant evidence from the cases on record, that many diseases and malformations of children are directly attributable to physical and mental defects and peculiarities of the parents, particularly as manifested in the abnormal condition of the mother.

For instance, ulcerations of the bowels of children at birth, have often been noticed, whose mother's had been troubled with inflammation of that organ during the period of gestation. Cancers and other diseases of liver have often been observed. Tubercles of the lungs are common even with still-born children, one or other of the parents having been similarly afflicted. The author of this work, a short time since, delivered a consumptive woman of child, who died subsequently from the disease. The child also died soon after birth, when an examination revealed its lungs studded with tubercles. while in some places ulcerations had commenced.

Montgomery gives a number of cases where tubercles were found in the lungs of children at birth, and in nearly every instance the mother labored under consumption at the time.

Dropsy is quite as common as consumption in infants previous to birth, as a resultant of the mother's infirmity in this regard. Obstetricians of extensive practice report many such instances.

Skin diseases may also occur. *Vogel* and *Rosen* mention two cases of children born with measles, the mothers having been afflicted with the disease prior to the birth of their offspring. *Guersent* reports similar instances of children born with the same disease, as a probable resultant of the parent's affliction with the disorder.

Montgomery tells of a child that had the *scarlatina* at birth, whose mother shortly before had recovered from scarlet fever.

Small-pox is another disease which sometimes occurs to

the foetus. *Mead* mentions a remarkable case, of a child born at full time, that presented a most horrible sight, being covered with small-pox pustules, of which it died previous to birth. The child contracted the disorder from the mother, who had nursed her husband with the distemper a short time before her confinement. *Billard* mentions a case of a six months' foetus that had contracted the affection from the mother, at an early stage of her pregnancy. *Pemphigus*, *Lobstein*, *Joerg*, and *Siebold*, detail similar instances.

Syphilis is another disease that is apt to be manifest in the child, if either parents had it at the time of conception. It is more apt to occur, however, a few weeks or months after birth. Cases have occurred where the child has been completely putrid from this disease at birth. *Cruveilhier*, *Collins*, and others, detail many such instances. The author has been two cases of the kind—the disorder making its appearance some time after birth, and traceable to the father, who had contracted the disease, and been imperfectly cured of it several years before.

A volume might be filled with instances of foetal diseases, concomitant of parental infirmities, were it necessary, to more fully substantiate what has already been detailed in regard to such peculiarities. The few cases now presented, should be sufficient to caution mothers of the liability of diseases and peculiarities being entailed upon their offspring.

CHAPTER XXI.

WOMAN'S SPHERE OF ACTION.

THERE are many weighty facts and majestic truths, which, amid the conventionalities of a strained or artificial state of society, do not receive the philosophical consideration which their immutable irrefragability demands. Among these are those which comprehend "Woman's Sphere of Action"—the amelioration of her present condition—and her advancement toward her proper and *natural* position in the scale of elevated humanity. With the elements and principles involved in Woman's greatest perfection and happiness, the public mind cannot become too familiar.

When we speak of "Woman's Rights" and "Woman's Sphere of Action," we do not wish to be placed in the category of those Modern Pseudo-Reformers who would have women *unsex* themselves by running into those wild vagaries and excesses of a Political and Social nature which have of late years brought odium on the glorious cause of woman's perfect emancipation from the condition of the servant and mistress of man. We go for her advancement in every attribute consistent with her normal organism, and the attainment of every exaltation that will render her fully the *equal* of man in all the moral and social relations of general society. Woman was never designed to be ranked as the "mere beast of burden," nor to be the despised creature of man's sensualities, or, at best, the idol and plaything of the sudden generousities and caprices of his lordly nature. She was created to be his "Helpmeet"—his companion and co-equal—an indispensable half of himself—without whose conjunction the *homo genus* could not exist.

Much has been said of late years of Woman's *potentiality*, in respect to the position which she *naturally* holds to man.

This potentiality is self-apparent, and cannot be fairly denied or contemned. There is a *parallelism* between the two sexes—man and woman—which cannot be obliterated. Woman is the *equal* of man—nothing more, nothing less. By consequence, there is no such thing as a “Sphere of Woman,” except as the phrase is applicable to the well-being of general humanity. Surely it is not for man to set bounds to what Nature has not, in determining, as such, the *sphere* of any human being. There is no such thing as either “man’s rights” or “woman’s rights,” in a distinctive sense. There is, however, such a thing as *human* rights, in the assertion and maintenance of which, both men and women are equally concerned. Women’s true orbit, especially, is the broadest enlargement of general humanity. As already asserted, the sexes are not only equal before God, but really and substantially so before the law and the world. Man may war against the laws of Nature, but he can never alter them. Then why should it be feared that woman at *liberty* would deviate from her *true orbit*, or transcend her natural mission? Is it not palpable, then, that whatever interferes with Woman’s making the most of the powers which Omnipotence has given her, is a gross violation of her inherent rights—a grievous wrong and injustice not only to Woman herself but to humanity at large? Surely none can gainsay propositions so glaringly self-evident as these. Fools may cavil about such points, but the wise must admit them, and push them forward to their ultimate and legitimate fruition.

In all ages of the world, Woman has ever been practically either the slave or mistress of man. She is so virtually *now*, even in our day of boasted civilization, refinement and intelligence, to a very large extent; yet her *present* condition is most gloriously advanced beyond her *status* of the more primordial times. If we institute a research of history, we will find that Woman’s position vibrates between that of legal servitude and forced homage.

There was a time, indeed, when women were deemed not

only an "inferior race," but doubts were entertained *whether they really belonged to the HUMAN RACE*. Not only was woman refused to be acknowledged as a *human* creature, but she has often been sold and transferred from one master to another, as sheep and asses and cattle are sold, as well by heathen as enlightened nations. The husband had the right among the Athenians to bequeath his wife, like a part of his estate, to any man whom he chose for his successor. The mother of *Demosthenes* was so bequeathed and left by will to *Apnobus*, among other personal property and real estate. Not many years ago, there was a law in England which prohibited the New Testament to be read by women. At this very day, it is stated as a fact, that an old law remains on the Statute Books of Great Britain, which permits a man to beat his wife with a stick the thickness of his thumb, while there have been recent instances where a husband has led his wife, by a halter around her neck, and sold her to another man, as he would a shote or a sheep. In Scotland, only a few years ago, women were not admitted as witnesses in civil cases. In Germany and France, women are, to this day, frequently seen working in harness with oxen and asses, and performing the most menial and degrading drugeries in the open fields and streets. In Turkey and Eastern lands Women have been denied to possess an immortal *soul* while their highest elevation has been to fill the harems and seraglios of sensual lords and masters.

Happily, however, this brutal and shameful degradation of women is being rapidly amelioriated, while there is a strong inclination felt among all truly refined and intelligent nations to recognize the indefeasible rights of Woman, and admit her to the *status* which is incontestibly her privilege as the equal of man before Immaculate Heaven and the world. Even in Turkey, *Polygamy* is rapidly losing its odious features. The Sultan himself has only seven wives, called "Kadines," who have the privilege of producing an heir to the throne. An American author, writing from Con-



EXERCISE 9—TO DEVELOP HEIGHT.



EXERCISE 14—TO REDUCE FLESH.

stantinople, says the "Sultan has great difficulty in managing his wives. He has become worried and teased and *caudled* into a shadow of a man by them. His heart is soft, his nature is kind, and they give him a world of trouble. They run him in debt, and though he forbids it, and swears he won't pay, yet pay he must, almost to his ruin."

The earnest manner in which the journalists of the United States are discussing the condition of women shows *thought* for her welfare has been at length awakened—that agitation is begun in the *right* quarter, with a view to the eradication not only of the musty errors of the past but of the many complicated social evils which still exist as affecting women's welfare and glory. Such movements would indicate that woman's emancipation from unnatural and unhallowed thralldom is not far remote.

It is indeed a happy sign to observe that many of the Legislatures of the States of America are yielding many essential points for the advantage of women. No sensible man can ever disparage laws of this wholesome description. The laws of divorce are amended for the better, as a general rule; while married women have now the right to the disposition of their own legitimate earnings, and receive suitable protection from the brutality of sottish husbands, who would reduce them to beggary and drive them into the pathways of shame and crime. The right of suffrage has been asked for women in certain quarters, but perhaps, wisely withheld. Surely, no woman having a proper appreciation of her own sensitive, delicate and peculiar organism, would ever wish to unsex herself and degrade the very name of woman, by an association with all the disgusting elements of discord now surrounding the political machinery of party warfare? The denial of the right of suffrage, in sooth, should be regarded as a decided compliment to woman's better nature. Indeed, so far as our knowledge goes, few women care to have extended to them the right of suffrage. They almost invariably object to be placed in a con-

dition which would involve them in the politics of their times. Woman is unfitted by nature to mingle in cabals and caucuses ; yet American ladies can exert and do exert a powerful influence upon the political history and destiny of their land. Their influence is of that quiet and silent kind which falls, as the snow-flakes fall, pure and genial, and more potential than the sword or ballot-box, for the general well-being of humanity. As mothers, wives, sisters, lovers and companions, they virtually make the laws of the land, though arrogant and self-sufficient man imagines that his will alone is sovereign and efficient for the happiness of the race.

Though I have referred to the degradation and inferiority of women, in the abstract, under barbarous and unnatural laws and restraints, in every clime, yet there are many instances, recorded in history, where woman has had her fullest rights acknowledged, and where her exercise of them has resulted in signal advantage to general humanity. For instance, the reign of *Elizabeth* of England, was distinguished as an era of glory and renown. She left behind her a name at which political infidelity, even at this late period, turns away in discomfort and dishonor. *Catherine* of Russia was the most splendid monarch of her times. Her career, though marked with crime, in some instances, was one which the world must ever applaud. Many other illustrious examples might be cited, were it necessary, to prove the *capacity* of woman to fill any position of life, or society, equally with man. In *France*, the *salique* law predominates, and no woman can ascend the throne ; but in England, *Queen Victoria* rules her people with a dignity and justice equal to that of any monarch that has ever wielded the sceptre of a mighty empire.

It may be emphatically asserted that most of the women of the present day who have been *properly educated*, are quite as well fitted for all the social and business relations of society as men. When thrown upon their own resources they acquit themselves in a manner well calculated to make

many of the "lords of creation" blush at their own positive *inferiority*, in every quality essential for success in life, in comparison with them.

In the United States they have been educated in theology, medicine, law, in sculpture, painting and many of the other noble and elevated pursuits and professions, and have found themselves fully equal to the duties and responsibilities involved in their respective spheres of action. The Rev. *Antoinette Brown*, *Miss Blackburn*, *Lucy Stone*, *Mrs. Spencer*, *Miss Hosmer*, are illustrious names among the theological legal and artistic professions, while in the literary fields the women who have won the amaranthine laurels are *legion!*

The public schools of all the great cities of America are now under the management of thoroughly-educated and accomplished female teachers. Our dry-goods stores are filled with female clerks, while they are found employed in many of the lighter pursuits of trade and industry, and everywhere having the preference over men for their steadiness of habits and industrious qualities.

As a further example of woman's industrial and artistic proficiency, it may be mentioned that many of the pictorial illustrations of the present volume have been achieved by women and girls. Who will say that they are not fully equal to any drawings and wood engravings ever executed by the sterner sex? The pictorials of the best illustrated journals of England and the United States are now the work of women. Their fields of labor are being gradually extended, and many find remunerating wages for their dainty skill and faithful toil. The time is coming when men will be driven from all the lighter pursuits of in-door occupations, and forced to seek those of the rougher toils of the open fields, as more compatible with the coarser elements of their normal organism.

Though we thus perceive that a reform is gradually creeping forward, calculated for extensive blessings to woman,

still there are yet too many thousand females in servile bondage and shameful degradation. The poor needle-women who make men's shirts at six cents apiece, and vests and pants, and other clothing, at "starvation prices," are in this deplorable category, not to speak of those females compelled to subsist by other means equally precarious. In Philadelphia, especially, there are a number of palatial Halls and Towers, peering up among the very clouds, devoted to the sale of clothing, whose avaricious proprietors have grown wealthy and insolent upon the excessive toil, tears and sufferings of the needle-women employed by them. Would it be credited that there are many men in Philadelphia engaged in the *unmanly* employment of making dresses for ladies?

Hood's affecting "Song of the Shirt," however, is reaching the hearts of many philanthropists and humanitarians, and will ultimately secure the amelioration of all the oppressed female industrials of the land, notwithstanding mercenary "bards" may be employed to write execrable dog-grel advertisements in perpetuation of the gross swindlings and robberies of women by pampered and profligate employers. Surely those who seek to aggrandize themselves on the sufferings and oppressions of women will but sow the wind to reap the whirlwind of popular scorn and engulfment in the final *denouement*.

Statistics show that the large amount of prostitution in London, New York, Philadelphia and other large cities, is chiefly owing to the miserable wages paid to women. We may talk about licensing the so-called "necessary evil," and putting restraints upon vice and crime; but there will never be a decrease of such fearful horrors until women can have full employment and adequate remuneration for services in all the honorable and decent walks of life and occupations. The innate modesty and virtue of the sex cause them to shrink with loathing from entering upon the "paths which take hold on hell;" but life is sweet and precious, and even

insult, injustice and frightful degradation are preferable to poverty, despair and death.

The truth is, as an eloquent writer expresses it, "The woman who does not labor—rich and honored though she bears on her head the inevitable curse of heaven. The curse works in her failing health—in her fading beauty—in her fretful temper—in her days devoured by ennui. Let her not even dare to think that because she has no domestic circle to care for, she is free from the law meant to be universal."

Labor, however, does not consist in servile and exhausting drudgery, but in a moderate and rational exercise of every function of the mental and physical organism.

God Almighty, we again affirm, only intended woman to be a "helpmeet" for man, but "man has sought out many inventions," and prefers as a general rule, even in this enlightened age, that woman shall be degraded to the condition of a servant or a harlot. It was the intention of the wise Ruler of the universe that men should take women for their wives, and that women should have the care of their households, and should rear and educate their children and make them useful and pleasant to their parents and society; but instead of this, in our day, in this glorious land of liberty, we drive women into the street to feed on garbage and to become a nuisance and disgrace to society.

There is no more manifest indication of the growing depravity of the times than may be seen in the large and increasing number of men who do not marry. Every man who remains in celibacy deprives a woman of support, and aids in driving her to despair and degradation; and why is it that men refuse to marry, and thus deprive themselves of the comforts of a home? Because they see that most of those who do marry condemn themselves to poverty and embarrassment. Honest, virtuous and useful conduct is not esteemed; but heartless avarice grows rich, and is honored and courted, while obscure worth is despised.

We see many articles in the public prints, speaking of the

uselessness and extravagance of American women, giving that as a *cause* for young men remaining single. But why are there so many useless, fashionable ladies? What is the cause of so much extravagance and indolence? In the first place women's principal pleasure is to please the men. A wife's greatest pleasure is, or should be, to please her husband. If you ask a married lady why she follows every foolish, frivolous fashion, she will be apt to answer, "Oh, we are compelled to fix up to make our husbands love us." Of course they have been taught that the only way to please their husbands and retain their love is to adorn their persons; and surely no one should blame them for the exercise of such a laudable ambition. But why do young ladies spend so much time in preparing for company, attending balls parties, the opera, and even the church? Go to the ball-room and watch the company, and you will soon see why it is that women are so fond of display, and take such pains to make fools of themselves. See that plain, but neatly-dressed lady; she wears but few ornaments, arranged with taste and simplicity. Her countenance is the index to a mind stored with useful knowledge—she can hold a sensible conversation on any subject; on her hands are visible the marks of the broom or smoothing iron; she can tell you how to make a pudding, bake a loaf of bread, or roast a fowl. But these are not the qualities to please the gentlemen—the dashing beaux and gallants. They may extend to her the compliments of the evening, but they will quickly pass on to prattle and flirt with some more dressy, though less sensible girl. See that delicate, fragile-looking lady, colorless except a spot on each cheek, her delicate person almost loaded with jewelry and costly apparel, her hands soft and tender, a languid smile plays about her face; as for cooking, she never thinks of such a vulgarity—that would be robbing servants; she can talk as much nonsense as any fashionable lady, while she can smile and sing fashionably besides. She is surrounded by admirers, all eager to confer a favor and so much

obliged to her for that smile if she happens to cast one in that direction. Young men make choice of ladies raised and educated in this manner, and then expect them to be perfect domestic wives! Where is the philosophy of that? Or, if their better judgment tells them their limited means will not permit of their marrying a fashionable lady, they remain single—for the most of young ladies belong to that class—because young men show a decided preference for ladies raised and educated in that manner. So long as fashionable airs and costly apparel receive more attention and respect than intelligence, simplicity and domestic accomplishment, uselessness, extravagance and profligacy will increase, and society become more and more degenerate. In sooth, it is not “charity” but “money” which covers a multitude of sins. Love of *show* and *splendor*, especially, now enter more largely into the marriage ceremony than *true conjugal affection*. The overstrained attentions which men pay to women, in fashionable circles, may well leave a sensible man in doubt as to which of the two, the man or the woman, has the better right to the appellation of the “softer sex.” Truly everything is silly and absurd that is not in accordance with the simple edicts of immaculate Nature.

It is palpably obvious that the proper way to find the *true* sphere of woman, is to educate her up to her fullest capacity. Why should not woman's *work* flow spontaneously from woman's nature? Would not this be the case were she left unrestrained to develop her real mission on earth? She should have a training worthy of her inheritance and the object of her creation, as the primal font of man's existence and happiness. From the very peculiarities of her organization, Woman's first and noblest place is the fulfilling of the duties of *Home!* We should have no fear that any freedom given to woman would ever estrange her from the place which God has so peculiarly fitted her to occupy. Woman can only be properly esteemed at *Home*. Here her sway is supreme, whether as mother, wife, sister,

friend or companion of man. Who can adequately define the heavenly qualities of a woman's love? The love of a true mother, a true wife, and a true woman is the most estimable blessing that can possibly be given to fallen and sinful man. He who would degrade the sex, and reduce her to the *slave* of his whims and lusts, is the unworthy, paltry wretch, whom it were an insult to Deity to denominate by the name of—*man!*

Every young lady is taught to consider marriage as the great and ultimate end of her life. It is that to which she looks forward for happiness. The female heart is naturally kind and generous—it feels its own weakness and its inability to encounter singly the snares and troubles of life; in short, that it must lean upon another in order to enjoy the delights most congenial to its natural feelings, and the emanation of those tender affections, in the exercise of which, the enjoyments of the female mind chiefly consist. It is thus that the heart of many young women become by degrees irrevocably fixed on those whom they were wont to regard with the utmost indifference, if not with contempt; merely from the latent principle of generosity existing in the original frame of their nature, a principle which is absolutely necessary toward the proper balancing of our respective rights and pleasures, as well as the regulation of the conduct of either sex to the other. Yea, a good wife is man's best safeguard against crime; and a baby in the cradle has often paid more than its milk score by putting many cheery thoughts in its father's heart, and inducing him to save his earnings for a rainy day.

Truly woman's sphere is *Home*. The *family* is conceded to be the most important of the divinely ordained institutions upon which the whole superstructure of society is based, and on which the happiness and moral welfare of all races and nations depend. It is this which constitutes the moral sanctity of all our earthly existence, and upon which God's first and earliest blessing rested, and is all that

is left to us of that once blissful paradise which our first parents occupied—the only blessing in fact which survived the fall. Around it clusters all our hopes of earthly happiness, and all the soul-connecting links that seemingly bind us to heaven. It is from this source that emanates all the strong and holy influences of a mother's love, all the sacred ties of parental affection and regard, all the filial and fraternal relations, obligations and duties of life, upon which not only the well-being, but the very existence of society itself depends. It is through the sacred privileges and immunities of the family that, according to the Divine dispensation, the race itself is to be perpetuated—not merely brought into existence, but nurtured, protected, educated, reared up to man's estate. How supremely glorious, then, is woman's mission! Who will deny that she possesses rights equal with man? Who would desecrate the rights and immunities of the family? Who would betray and deceive his offspring? Who would flaunt vice in the presence of innocence and purity? Who would esteem woman as the mere mistress and servant of despotic and brutalized man? Every principle of justice and humanity condemns the debasing inequalities of conventional society, and demands the highest happiness and perfection of WOMAN.

In conclusion, we may observe, that wherever we find Woman exercising good sense, modesty and discretion, we will find her filling a sphere of real usefulness and nobly assisting to work out the great and mysterious problem concomitant of man's ultimate exaltation and felicity on earth.

CHAPTER XXII.

ELEMENTS OF FEMALE BEAUTY.

IMPORTANCE OF UNDERSTANDING THE SUBJECT OF HUMAN BEAUTY.

DR. PRITCHARD has well expressed a great truth in his observation that the "ideal of beauty of person is synonymous with that of *health* and *perfect organization*."

In fact, the perception of human beauty is the chief principle in every country which directs men in their marriages.

Sir *Anthony Carlile* thinks that "a taste for beauty is worthy of being cultivated." "Man," he remarks, "dwells with felicity even on *ideal* female attributes, and in imagination discovers beauties and perfections which solace his wearied hours, far beyond any other resource within the scope of human life. It cannot, therefore, be unwise to cultivate and refine this natural tendency, and to enhance, if possible, these charms of life."

Horne, in his "Elements of Criticism," observes "that a perception of beauty in external objects is requisite to attach us to them; that it greatly promotes industry, by promoting a desire to possess things that are beautiful."

Unboubtedly, we would say, that the *possession* of "beauty" and "worth" constitute not only the *bond* of attraction, but the *very life* of the social union.

The body is as much a desirable part of the human being as the mind. It is the medium by which *all* our senses are discernable. By the body do we communicate hopes, fears, affections and love, and receive them. Why should we, therefore, contemn as a piece of common clay that which is the only emblem of our existence? God created the body, not only for usefulness, but with loveliness. Then, what

he has made so pleasing shall we disesteem, and refuse to apply our knowledge to its admirable destination?

The very approving and innocent complacency we all feel in the contemplation of beauty, whether it be that of a landscape or of a flower, is a sufficient witness that the pleasure which pervades our hearts at the sight of human beauty was planted there by the Great Framer of all things, as a principle of delight and attraction. To this end we are called to the study of the principles of human beauty and perpetuation.

ANATOMICAL AND PHYSIOLOGICAL PRINCIPLES OF BEAUTY.

To acquire a knowledge of external beauty, some little physiological information as well as anatomical is desirable. The human body is composed of *parts*, each part contributes a separate economy depending on the *whole*, and the whole is sustained by its *parts*. Internally there is a strong framework of bones called

THE SKELETON,

Upon which the superstructure rests. The bones consist of a mixture of earthy and animal matter. The earthy part gives them solidity and strength, while the animal part endows them with vitality. The active and industrious person, whose digestion is good, and lungs healthy and well-developed, will have generally well-formed limbs.

Sir *Charles Bell*, in his "Animal Mechanics," thus describes the beauty of the human framework, as exhibited in the spinal construction:

"The spine consists of twenty-four bones, each bending a little and making a joint with its fellow—all yielding in a slight degree, and permitting, in its whole line, that degree of flexibility which is necessary to the motions of the body. Between these bones or *vertebræ* there is an elastic, gristly substance, which permits them to approach and play

a little in the actions of the body. Whenever there is a weight upon the head, this gristle yields; and the moment it is removed, the gristle regains its place, and the bones resume their position. The spine, which is in the form of an italic *f*, yields, recoils, and forms the most perfect spring calculated to carry the head without jar or injury. The spine rests on what is called the pelvis, a circle of bones, of which the haunches are the extreme parts."

Connected with the framework comes

THE MUSCULAR SYSTEM.

Over the bones is laid a thick bed of muscular flesh, in regular layers, composed of long, slender fibers, that usually run parallel with each other, and are fastened by a strong, whitish-looking substance, into bundles. They constitute the bulk of the limbs, and much of the back and neck. Each of these layers acts like a pulley, rising and depressing the bones at the will of the individual.

THE NUTRITIVE SYSTEM,

Or nutritive apparatus, comes next. This embraces the stomach, heart, lungs, liver, pancreas, blood, viscera, etc. The general office of these organs is to digest the food, convert it into chyme, absorb the chyle and convey it through the body by muscular action and eject the refuse from the system. The blood is kept pure by the lungs. It is a law of nature that each of these organs is excited to healthy action by its appropriate stimulus. Accordingly, food that is *adapted* to the wants of the system imparts a healthy stimulus to the salivary glands during the process of mastication. Food well *masticated*, and blended with a *proper* amount of saliva, will induce a healthy action in the stomach, as this *is its* appropriate stimulus. Well prepared *chyme* is the natural stimulus of the duodenum, liver and lungs. If the process of *mastication* and *insalivation* are defective,

the whole machinery is wrong, and danger and death are not very remote. When these organs are sound and healthy, they give the human form that beautiful, full and rounded outline, so desirable in preference to sharp points and angles.

THE NERVOUS SYSTEM

Constitutes the grand medium through which we have communication with every part of the body and the external world. The former systems or functions refer to *organic* life or structure. The nervous system, which is the central and governing apparatus of life, consists of the brain, the spinal cord and the nerves. The brain is in the head, the spinal cord is enclosed in the channel of the backbone, and the nerves are distributed to all the organs and parts of the body. As our astronomical system is called the solar system, because the sun is in the center watching over our planets, so of these nerves, whose center is the brain and spinal marrow, but whose smaller departments communicate with every part of our miniature universe.

THE RELATIVE BEAUTY OF THE MALE AND FEMALE FORMS.

It is only by carefully regarding the admirable models of the ancients that we can gain correct notions of manly beauty and female loveliness.

Both should be proportionately developed in their separate systems. The female should have the nutritive elements predominating, while the male should excel in the nervous or mental and locomotive.

Weak haunches in the male indicate lumbar weakness, and overgrowth in the procreant functions. On the contrary, wide haunches are a beauty to the female, proving that the reproductive organs are well developed.

A well-formed man should have his shoulders wider and more prominent than his hips. A well-formed woman should be the reverse.

He should taper from the shoulders up and down—she should taper up and down from the abdomen and hips.

The female should have shoulders and chest small but compact, arms and limbs relatively short; her hips apart and elevated, her abdomen large, and her thigh voluminous. The male should be large about the chest, to indicate expansive lungs; small around the hips to imply locomotive power and vigor.

The length of the neck should be proportionately less in man than woman, because the dependence of the mental system on the nutritive is connected with the shorter distance of the vessels of the neck.

The back of woman should be more hollow than that of man, to give sufficient depth for parturition. The loins of woman should be more extended at the expense of the superior and inferior parts, than in man, to allow easy gestation. The surface of the whole female form should be characterized by plumpness, elasticity, delicacy and smoothness, because this is not only essential to beauty in woman, but is necessary for the gradual and easy expansion of her person during gestation and delivery. Man should be muscular and wiry, as indicative of strength and energy.

The principal object of a true man's discourse should be what is useful; that of a true woman's that which is agreeable. There should be nothing in common in their discourse but truth—nothing in their feelings but mutual affection. As the poet has beautifully expressed it,—

“Man is the proud and lofty pine
That frowns on many a wave-beat shore;
Woman, the young and tender vine,
Whose curling tendrils round it twine
And deck its rough bark o'er.”

The most perfect model of the human female ever created by Grecian art is that of the celebrated piece of sculpture known as

THE VENUS DE MEDICI.

It was not only the favorite of the Greeks and Romans,

but has been the admiration of every intelligent traveler and artist who has seen it. A copy of it should adorn the houses of all who would wish to accustom themselves to the highest conceptions of the human form. The whole figure displays profound physiological and physiognomical knowledge, even in the minutest detail, and is worthy of careful study by the lover of the beauty of his species.

Sir *James Clark* says that young ladies should take the *Venus de Medici* as the example of what a female figure should be. Every man of true taste, also, should look upon every female as approaching perfection in the proportion as she approaches either the figure of the "*Venus de Medici*," or the celebrated piece of sculptuary by *Hiram Powers* known as the "*Greek Slave*."

CHAPTER XXIII.

SOME OF THE PRINCIPAL DISEASES OCCURRING FROM INFANCY TO PUBERTY.

IN a work of the present limits it will be impossible to speak of all the ailments incident to women and children, therefore reference will only be made to those of the most important and intractable character—the leading features of which will be succinctly and faithfully presented. It is, however, not expected that females uneducated in medicine will be enabled to treat of all the forms of disease mentioned in this volume. Diseases not unfrequently assume a very severe form, both in children and those of pubescent persons; hence the attention of some skillful practitioner will be promptly required, in order to maintain the *vis vitæ* of the organism from the ravages of the maladies.

The diseases of which this work shall treat will generally yield to the treatment and remedies suggested, and, therefore, in most cases, may be regarded as eminently reliable for their curative effects.

Before entering upon the subject of special diseases, it will be necessary to treat of *Irritation*, as it is a condition frequently occurring in children, and sometimes mistaken for inflammation.

IRRITATION AND SYMPATHY.

IRRITATION is produced from some exciting cause operating on some part of the system, and thence extending to other organs or parts, through a law of *sympathy*. The younger and more delicate the child, the more susceptible is its constitution to irritating causes. For instance, the slightest pressure of the teeth against the dental cartilage



EXERCISE 8—TO PERFECT THE FIGURE.



EXERCISE 8—SYMMETRY OF FORM.

or gum in an infant, is sufficient to produce the most alarming symptoms, such as convulsions, and other cerebral derangements. Again, irritation of the bowels, liver, etc., will cause bilious derangements, diarrhœa, or cholera infantum, and a long train of other maladies. It is thus perceived that it is highly important to possess a correct idea of irritation, before attempting to combat either its effects or the diseases concomitant of its influence.

As a celebrated writer has well remarked, a knowledge of this influence is as essential to the medical practitioner as the compass is to the mariner. It is a guide to him in the detection of disease, and enables him to use proper remedies for its removal, which he could not otherwise command. It will also prevent, in many instances, the use of depleting means with a view of allaying inflammation, when the system, in fact, is only under the influence of some morbid excitement or irritation. Unfortunately for patients, many acute diseases are treated as the result of some inflammatory action or organic lesion, and, accordingly the system is reduced by blood-letting and other antiphlogistic treatment, when the disorder is nothing more than simple irritation.

Many children, with naturally strong constitutions, are compelled to struggle through a course of treatment based upon inflammatory action. Thus it is that a large majority sink under such treatment. The bills of infantile mortality most abundantly attest this fact. It is palpable that nearly all the diseases of children arise from irritation and not from inflammation; hence the barbarous system of depletion, in such cases, cannot be too severely condemned. It but adds injury to injury, or fuel to the flame, in order to extinguish it!

Dr. *Copeland*, speaking of the Pathology of Irritation, observes, that if an irritant or stimulus acts upon a living tissue or organ, certain changes are produced. If the digestive organ be acted upon by an irritant, certain actions are increased or modified; while if the irritant be increased,

the irritation is increased and extended to other parts. Any function of a part may be more or less modified by the application of an irritant, or be so disordered as to be completely overturned. If a portion of the intestinal canal be irritated by mechanical or chemical stimuli, its contractility is augmented—the secretion and circulation of the canal more or less accelerated, and the sensibility increased, causing pain, in more or less degree or acuteness. In addition to these local changes, if the irritatives be increased, the influence is extended to different parts, through the medium of the nervous system.

In this way one organ is made to sympathize with other and more remote organs. Hence, an irritant applied to the stomach may extend to the intestines and produce colic pains; or to the liver, causing an increased flow of bile; or to the lungs, heart or brain and excite morbid action and distress.

Again, if an irritant be applied to the kidneys, it may produce not only symptoms of inflammation in them, but the irritation may extend to the stomach, through the nervous connection, and cause vomiting; or it may extend to the genital organs, and greatly excite and injure them.

Similar sympathy may arise from teething, and produce vomiting, purging, griping, with green bilious discharges, as the result of the irritation extending to the stomach, liver and intestinal canal; or it may extend to the brain and spinal cord, producing convulsions and coma. Improper food taken into the stomach, or worms in the intestinal canal produce similar symptoms.

External impressions, such as fear, etc., may produce convulsions, and symptoms of apoplexy, in children. *Hood*, in his work on diseases of children, gives two striking cases in this regard. A nobleman having anxiously desired a son to be born to him, in order to inherit his fortune and title, his wishes at length were gratified. Preparations were made on a grand scale for the infant's christening, which cere-

mony was to take place at night, in a brilliantly lighted room. When the child was brought in for such purpose, the sudden flare of light caused instantaneous convulsions, from which, soon after, the infant died. The other was a case, also, where the first-born son of a noble family was to be christened. The bishop had arrived to perform the sacred rite, when the servants knocked so loudly at the door, that the child was frightened and dies of convulsions in consequence.

Irritation when slight may be confined to the part, but cannot exist long without other organs experiencing the same disorder through the sympathetic and cerebro-spinal nervous system.

The more susceptible the nervous system, the more readily are these symptoms between the different organs set up. This is well illustrated in the delicate female laboring under uterine irritation. The sympathy will extend from the uterus to the stomach, and produce derangement of that organ; to the heart, and cause palpitation; to the head, and produce neuralgia; or to other parts of the system, and thus excite the symptoms of a variety of other diseases. Flatulence in the stomach is a very common exciting cause of palpitation of the heart. So will deranged liver and stomach produce the same result. Hence, a physician should have a full knowledge of the laws of sympathy before attempting to treat or remove disease from the organism.

In all organized beings, there is a natural or normal susceptibility, called by some a normal irritability peculiar to the nervous system. This susceptibility is increased by debility of the nervous system, which makes the whole organism more susceptible to irritating causes. This is seen in a child with its health impaired by teething. It is then more liable to cold from exposure, particularly of the lungs. Mothers, accordingly, should never expose the tender infant's neck and arms, when their own systems would revolt at such unnatural treatment. Thousands of children are annually sacrificed by this foolish and cruel habit alone.

As children advance in age, the susceptibility diminishes, and there is less liability to irritability from exciting causes. We may compare the infant, by way of analogy, to the delicate shoot from the parent plant or shrub. It will wither and die from the slightest frost, while the parent tree or plant is not materially affected by the winter's blasts.

There are some temperaments more liable to irritating influences than others. Children of the nervous and sanguine are more susceptible to irritabilities than those of the bilious or phlegmatic temperaments. The nervous and sanguine are characterized by light eyes and hair, and fair skin, the bilious and phlegmatic have dark hair, eyes and skin. The former are much more susceptible to medicines than the latter. The temperaments are sometimes mixed—the nervous and sanguine uniting, or the nervous and bilious, in the same individual. It is necessary that the temperaments of children be studied as well as their physiognomy. The latter is of the most importance to the medical practitioner. In fact, no physician can be successful in the treatment of children, unless he can diagnose from the physiognomy of the child.

It is said of the celebrated physician *Andral*, that he had such a knowledge of physiognomical presentations of diseases, that he could, by surveying the features of a patient, detect the disease lurking in the system, and point it out without questioning the patient.

The illustrious *Haller* expresses himself thus: "It is the will of God, the great Author of society, that the affections of the mind should express themselves by the voice, the gesture, but especially by the countenance. Nor is this species of language wholly denied even to the brute creation. They, too, by signs, express their love of kind, social friendship, maternal affection, or rage, joy, grief, fear, and all the more violent emotions. A dog easily discovers whether you be angry with him, by your face and tone of voice."

The physiognomy of countenance has been ably treated by *Lavater*, who asks:

“Does the human face—the mirror of the Diety—that masterpiece of the visible creation, present no appearance of cause and effect; no relation between the external and the internal, the visible and the invisible, and the cause which produces?” As to physicians, he remarks:

“The physiognomy of the patient frequently instructs him better than all the verbal information he can receive from the invalid. It is astonishing how far some physicians can carry their sagacity in this respect.”

The author of the present volume was called, not long since, to see the son of a physician, who labored under a disorder that seemed to baffle all the remedies applied. The lad was about twelve years of age, of a sanguine temperament. The writer found him in a comatose state, in which he had lain for twelve hours. The remedies had been used without any effect, from a belief that the cause of disorder was confined to the brain. When the author saw the expression of his countenance, he came to the conclusion that the stomach was at fault. This proved the fact on examination. A few cups and a blister to the stomach cured the lad before morning, to the astonishment of the father, who had looked upon the case as hopeless. An emetic would have afforded relief much sooner, but it could not be readily given owing to the coma.

Another case, equally striking, may be mentioned. I was called in haste by a physician, to consult with him in a severe case of cerebritis, or inflammation of the brain. The patient was a powerful, muscular man, mate of one of the Liverpool packets sailing out of the port of Philadelphia. He was over six feet in height and weighed about two hundred and twenty pounds. He lay insensible in the bed, bedewed with a cold perspiration, his clothes as effectually saturated as if he had been dipped in a pool of water. His pulse was about sixty, and very weak. His countenance indicated

gastric derangement; on examination, my suspicions were verified. He was accordingly cupped over the stomach and consciousness speedily returned, and the next day he was well, except feeling a little weak.

Here are two striking cases, showing that an irritation of a local part had the power to affect the brain through a sympathetic influence alone. They will illustrate the importance of studying physiognomy in diagnosing diseases.

From an inspection of a child's countenance much information may be gained. If a child looks heavy about the eyes, has a pale face, and moves and rolls its head from side to side, and cries frequently, it is an evidence that it suffers from headache. If it frowns and dislikes the light, it shows some derangement in the circulation of the brain. If the pupil is dilated and remains so on exposure to light, we may rest assured there is congestion of the brain. Should the pupil contract powerfully on exposing the eye to the light, it is evidence of irritation of the brain. If the features seem pinched (the muscles of the forehead contracted,) and if there be bluishness around the upper lip, the edges of the nose and angles of the mouth, or if the legs be drawn up and the child screams and starts—if there be any or all of these appearances—they will present evidence of griping from flatulence or acidity of stomach or bowels.

If the lips, tongue and mouth are dry, and there is a throwing of the hands back of the ear, it is an evidence of pain in the gums from teething.

If the child's flesh feels soft and flabby, blue veins appearing upon the forehead, and between the eyes, and its features are pale, with little life or animation, it is evidence that the child has impoverished blood. In such children, according to Dr. *Hood*, there is danger of that alarming and fatal disease, usually called laryngismus stridulus or crowing respiration of infants.

The skin is also a guide. If it be bluish-white and "pasty" it is an evidence of the impurity of the blood. If of a "dirty

yellow" it indicates deranged liver. If the skin is dark and dry, it is an evidence of irritation in some of the vital organs.

The position of the child is also a guide to the physician. If it seems to be lying naturally, with its arms folded, and thighs drawn up toward its belly, and lying on its side, it is a sign that the child is doing well, and not suffering from any great amount of irritation or derangement of the system.

These facts and views cannot be too attentively considered by physicians and mothers, when treating the diseases to which children are subject.

DENTITION OR TEETHING.

For a description of the formation and development of the teeth, the reader is referred to Part III of this work.

The protrusion of the tooth through the gum takes place at different periods in different children. As a general rule, they commence six months after birth, and end at two and a half years. The first are called deciduous teeth, and are twenty in number, ten upon the upper and ten upon the under jaw. They usually appear in the following order:

- 1st. Two lower incisors or front teeth.
- 2d. Two upper incisors. These usually appear from the sixth to the eighth month.
- 3d. The first lower molars or jaw teeth.
- 4th. The first upper molars. These usually appear from the twelfth to the sixteenth month.
- 5th. Lower canine or stomach teeth.
- 6th. Upper canine or eye-teeth. These usually appear from the fourteenth to the twentieth month.
- 7th. The four last molar or jaw teeth. These usually appear from the twenty-fourth to the thirtieth month.

Some children are very irregular in cutting their teeth. In a few instances they are born with their front teeth already cut. Sometimes the lower teeth appear before the upper ones; while some children do not commence cutting them until they are nearly eighteen months old.

Meckel mentions a case where there was but a single

tooth to each jaw; and another case where there was none. It is more common, however, to meet with an excess than deficiency.

The cutting of the teeth may produce functional derangement in almost every organ of the body, through the irritation and pain occasioned by the pressure of the tooth against the sensitive dental nerves. The brain, stomach, lungs, liver, bowels, from such cause. Hence the dread that mothers have for the second summer, which induces many to nurse longer than they otherwise would.

During dentition, the child becomes restless and peevish; the mouth is hot and dry; sometimes there is a free flow of saliva; frequent putting the fingers in the mouth; throwing the hands back of the ears, wakefulness and restlessness at night, etc. The irritation may affect other parts of the system sympathetically. This is more apt to be the case in weak and delicate children, because the system in such cases is more susceptible to irritation than in those of robust constitutions. With some children the brain and spinal-nervous system particularly sympathize, causing convulsions, spasmodic twitchings, etc. Sometimes the irritation extends to the lungs, producing obstinate and protracted cough; or to the stomach and bowels, causing sickness, vomiting, and looseness of the bowels. If the looseness of the bowels is only moderate, it acts favorably by relieving the brain. Sometimes the irritation extends to the skin, inducing eruptions which may continue during dentition. The eruption is more apt to make its appearance behind the ears or upon the face.

Treatment.—If the bowels are inclined to be costive, they should be opened with some mild purgative or enema.

The child should frequently be offered cold drinks and its gums bathed with cold water. This may be done by saturating a rag with ice-water, and placing it frequently on the gums.

Looseness of the bowels should not be checked unless it

is such as to reduce the strength of the child; nor should eruptions be interfered with, for their appearance is often the salvation of the child.

If the gum is hot, too sore, or too highly inflamed, the child should be induced to chew upon some hard substance, such as ivory or bone. When the gum is highly inflamed, and the tooth well advanced, the gum may be divided with a lance or sharp knife. The incision should be made through the gum. If the tooth is not well advanced, it is best not to lance, on account of the edges uniting and forming a hard cicatrix, which makes it more difficult for the penetration of the teeth afterward.

If alarming symptoms should occur, such as convulsions and incessant drainings from the bowels, attended with vomiting, there should be no hesitation in lancing the gums. It will often give immediate relief, by unloading the congestive capillaries of the gum and lessen the irritation. Sometimes it is necessary to lance after a portion of the tooth has protruded through the gum, in order to relieve it from pressing against the sharp edges of the tooth. This is the case with the eye, stomach, and front teeth.

If the bowels should be too loose, they should be moderately checked.

Should there be convulsions the child should be set in warm water. The mere placing the feet in warm water will not answer. The lower part of its body and limbs should be immersed, and cold applications made to the head by saturating cloths with ice-water. The tooth should also be lanced at once, provided the gum is swollen and inflamed. It is surprising to find what instantaneous relief is sometimes afforded by lancing the gum. This process relieves the pressure on the dental nerves, and removes the bulk of irritation. At the same time the bowels must be kept open.

Sponging the child's head and face several times a day with cold water, will afford great relief, when there is much fever and hot skin. In weak and delicate children, fresh

country air will afford more relief and tend to keep down the irritation than all the medicine that can be administered. If the child cannot be taken into the country, it should be carried early in the morning into the open air, with its body well protected from exposure. It should be kept from the night air, while its sleeping chamber should be well ventilated.

The child's diet should receive strict attention. If the mother's milk agrees with it, it will require no other nourishment. If it is not nursed, the milk from the same cow should be given, after being boiled. If the bowels incline to be loose, a cracker soaked in the milk and it sweetened with loaf sugar, with a little nutmeg added, may be used. If the child is much debilitated, cream half diluted with milk may be given, and occasionally a few drops of wine with water and nutmeg.

CHOLERA INFANTUM, OR SUMMER COMPLAINT.

This is one of the most fatal diseases of children: It usually occurs during the first or second summer—frequently from the irritation attendant upon dentition. Another frequent cause is improper diet and the bad ventilation of the apartments in which the children, especially of the poorer classes of society, are compelled to live.

Symptoms.—The attack of Summer complaint is usually preceded by diarrhœa, existing in some cases for some time previously with the patient. Sometimes the attack will be instantaneous, commencing with violent vomiting and purging. At times the stomach is so irritable as to eject everything taken into it, even a mouthful of cold water, at the same time there is spasmodic pains in the stomach and bowels. The features become shrunk, the skin cool and clammy, the eyes half closed, while there is partial insensibility and twitching and starting. Insensibility may continue until it amounts to coma and death.

The disease may commence and terminate with these symptoms in two or three days, or a shorter period. In those fatal cases, attended with insensibility, there is a morbid condition of the brain. The attacks are attended usually with fever and quick pulse; the pulse is also weak or corded; the mouth is hot and dry; tongue furred; extremities cool, while the surface of the body and head is hot. If the attack is very severe, the child weakens rapidly; the eyes become shrunken; the surface cool and pale, harsh and dry.

In some of the very severe cases, the mucous membrane of the mouth and tongue takes on an aphthous or inflamed condition, the whole surface becoming covered with white ulcers or sloughs. Sometimes they present a dark-brownish appearance, which is indicative of great debility or prostration. Frequently an eruption appears upon the body, resembling flea-bites, called *petechiæ*. The skin, also, presents a dirty, dull hue, the eyes are blood-shotten, while the emaciation is in the extreme.

The discharge from the bowels are as various as are the symptoms. At first they seem to consist principally of undigested food, such as curdled milk, and other coagulated liquids. As they become more copious and frequent, they consist of yellow or yellowish-white secretions; or they may be green and slimy. During the disease they seldom present the natural fecal odor. The matter vomited is sour, slimy, and sometimes a yellowish-green liquid. The disease may continue for weeks or months, providing the exciting cause is not removed.

Causes.—Unwholesome food, dentition, ill-ventilated apartments, and the increasing temperature of the weather, are the most prominent causes of the complaint.

Treatment.—The first step in the treatment is to remove the causes that keep up the irritation. The second is to allay the irritation. If it be the heated and impure atmosphere, the child should be removed to the country, if practicable. If this cannot be accomplished, it should be kept as much

as may be deemed advisable in the open air, during the day, by airings in the parks, excursions on the water, or in drives about the suburbs of towns and cities. I have known a day's trip on the river to arrest the most alarming symptoms, when all other curative means had failed. I have also known one day's confinement in a crowded and heated apartment, to bring back the symptoms in their fullest virulence and force. Sometimes the mother's milk will disagree with the child. This it is sure to do, if it contains cholostrum. The mothers' anxiety of mind may also act as a secondary cause to render the lacteal fluid unfit for the child. For full information on this point, see the article on LACTATION, in another part of this volume. If the exciting cause be dentition, the treatment recommended in that article should be employed. If the mother's milk or her mental anxiety be the cause of the child's illness, a wet nurse should be procured, or a resort be had to artificial nursing.

If the teeth press against the dental nerve, and it be inflamed and reddened, the gum should be lanced. As a general rule, the more gently the child is treated, and the less medicine that is given, the better, to insure its recovery to health. Thousands of children are annually virtually slaughtered by over-dosing with medicine, instead of allowing Nature an opportunity of exerting her recuperative power in overcoming the difficulty.

SCARLET FEVER.

This is a disease of fearful mortality among children, in some seasons, leaving its desolating effects in many families, whether the affluent or humble.

There are three varieties of Scarlet Fever—*Scarlatina Simple*, *Scarlatina Anginosa*, and *Scarlatina Maligna*—usually described by writers. We present another form, frequently met with, called by some *Scarlatina without eruption*.

..

All these forms are one and the same, only manifesting different degrees of severity. In some cases they are so intimately blended that it is almost impossible to designate to which division they belong.

The first and last divisions are attended with but little danger and usually run their course in four or five days.

The other two forms, if not treated early, will terminate in gangrene, sloughing and fatal disorganization of the throat and larynx.

Scarlet fever is more prevalent in the Fall and Winter, and usually occurs in children after dentition and before puberty.

Scarlet fever is often mistaken for other Febrile diseases, particularly Measles. It may be distinguished from Measles by the absence of the catarrhal symptoms, which always accompany the latter. The rash occurs earlier in Scarlet Fever than in the Measles. In the first, it makes its appearance on the second day; in the other, usually about the fourth day. Scarlet Fever is also accompanied with sore throat and redness of the fauces. In Scarlet Fever, the eruption makes its appearance in a small rash, which runs together in patches. In Measles, the eruption consists in small circular dots like flea-bites, that cluster together. The rash in Measles is not near so red as in Scarlet Fever.

SCARLATINA SIMPLEX.—Chilly sensations, or shiverings, succeeded by frequent pulse, headache, nausea, and slight soreness of the throat. In about two days or forty-eight hours, the eruption makes its appearance upon the face and neck, and gradually extends to the body and extremities. The eruption consists of fine red pimples which seem to run together and extend over the whole surface of the body. After the eruption makes its appearance the unpleasant symptoms, such as nausea and oppression at the stomach, subside. On the fourth or fifth day, the eruption has run its course, when the skin desquamates and convalescence occurs.

SCARLATINA ANGINOSA.—*Symptoms*.—In this variety the symptoms are more strongly marked than in the foregoing. The chilliness is greater, the pulse stronger, there is more nausea and vomiting, the throat is very sore and deglutition or swallowing difficult and painful. The tongue is covered with a white or yellowish fur; the fauces, throat and tonsils are swollen, inflamed, and ulcerated; the voice thick and hoarse, with difficult breathing and slight cough. There is severe headache, the eyes are swollen and injected, while there is stiffness of the neck and tenderness of the abdomen and stomach.

The eruption does not usually make its appearance so soon as in *Scarlatina Simplex*; but occur from the second to the fifth day, and are uniformly diffused over the whole body, or in blotches. If the disease terminates favorably, the eruptions commence subsiding about the sixth or eighth day, and gradually convalescence is established.

Should the eruptions extend down into the stomach and bronchi instead of extending out under the skin, all the symptoms become more aggravated; inflammation of the stomach, bronchi, and brain supervene, which, if not speedily arrested, terminate fatally. In this disease the inflammation ranges higher than in most other febrile diseases, with a strong, bounding pulse.

SCARLATINA MALIGNA.—This is one of the most dangerous diseases the physician has to contend against. It usually commences with the ordinary train of symptoms, as indicated in the last form, but very soon gives way to those of a typhoid character, producing great prostration of the system. The pulse becomes less frequent, and weak; the skin, instead of assuming a bright red appearance, is pale; the heat subsides below the healthy standard; the eye becomes dull and diffused; the throat covered with ulcers of a pale ash color; the fauces and larynx become swollen and inflamed, as well as the bronchi; an acrid discharge passes

from the nostrils, and the tongue becomes dry and of a dark mahogany hue, followed by diarrhœa and hemorrhage.

The disease may also extend to the brain, as well as the abdominal viscera, causing coma and death.

The ulcers of the throat often slough, destroying or involving the soft part and cartilages of the larynx.

In some cases of scarlatina maligna, the eruption does not make its appearance upon the surface of the body. In others, a few blotches make their appearance and disappear. In another class of cases, most alarming symptoms occur, as it were, all at once, overwhelming the *vis vitæ* of the system in a few hours, and causing death.

SCARLATINA WITHOUT ERUPTION.—During the prevalence of scarlet fever, there are cases of fever and sore throat, which seem to run the exact course of the disease. These are said to be capable of imparting scarlet fever.

Cause.—Scarlet fever no doubt results from a morbid contagion. This contagion is no doubt diffused through the atmosphere, occurring in some sections of country as epidemic. Persons of all ages are liable to the disease—adult females more than adult males, and children more than either of the other two. It is, however, more fatal to males after puberty than to females after menstruation. There is only small liability to the disease after the age of fifty.

Without doubt, scarlet fever, like measles, depends upon an infusoria which locate in the mucous membranes of the fauces, and either follows the course of the mucous membrane into the stomach and air passages, or travels out under the epidermis or outer layer of the skin.

The idea of the rash striking in after it makes its appearance, is an absurdity. The basement membrane of the skin and mucous membrane is a matrix in which the infusoria seem to be rapidly nourished. Its usual course is outward, under the epidermis. In the malignant form of the disease, it follows the course of the mucous membrane, involving

the stomach, bowels, and lungs, which being vital organs must produce disastrous effects upon the system.

In malignant forms the system is more susceptible to its influences. The rapid development of infusoria causes ulceration and sloughing of the mucous membrane of the throat, if such development be not speedily arrested. This may be readily done, if the proper means be adapted, as we shall presently show.

Scarlet fever is always worse in low, damp, and badly drained districts, which seem to favor the *Infusoria* theory of scarlet fever.

It has been noticed that feather beds, woolen bedclothes, etc., when not exposed to fresh air will retain for a long time the contagion.

Dr. *Withering*, in his work on "Scarlet Fever," states, in his opinion, that scarlet fever poison first lodges in the mucous membrane of the fauces. He accordingly recommends those who are exposed, to promote the discharge from the throat and mouth and frequently spit out the secretion. He also advises those who have imbibed the poison to take an emetic and frequently wash out the throat with soap-lye diluted with water.

Dr. *Hood*, in his work on "Scarlet Fever," states, that Dr. Fuller informed him, that when attending a case of a young man laboring under the malignant form of scarlet fever, he recommended his mother—who kept a boarding house that was full of boarders, who became greatly alarmed—to saturate towels dipped in chlorine water and hang them on backs of chairs, so that the air of the chambers might be thoroughly impregnated with its qualities. The result was that not one of the family contracted the disease. Strange to say, also, the young man whose throat was very painful, and attended with great difficulty in swallowing, was so much influenced in half an hour by the chlorine, that his throat became much better, and all his symptoms subsided.

Dr. Hood always employed chlorine after this in scarlet fever, with signal advantage. I have also used chlorine in the treatment of scarlet fever, with entire satisfaction in the worst forms of the disease.

TREATMENT.

If there be difficulty in swallowing, if the throat and tonsils are inflamed and swollen, if the face be injected and there be suffusion of the eyes, with strong bounding pulse and dry skin, I administer an emetic and produce free vomiting. This will reduce all these symptoms and afford a more prompt action for other remedies.

After vomiting, the skin becomes moist, the bowels are relieved, and the child will say it feels much better, and complain of feeling hungry, which may be gratified by giving a little toast and tea.

Emetics may also be usefully employed during the course of the disease, if there be swelling of the throat and other urgent symptoms; or if there be evidence of insensibility or coma, or sickness of the stomach—thus relieving the brain, and eliminating the bilious and acid secretions, the one being the cause of coma and the other of the nausea, etc.

Emetics may be safely administered in the worst and lowest forms of the disease. Where the brain is affected and the bowels not relaxed, a mild purgative may be given.

After the stomach is freely evacuated and the bowels acted upon, take a solution of tincture of myrrh and swab out the throat and mouth with it, provided the child is not too young to apply the gargle. The swab may be made by tying a piece of rag around a stick. If a little of the solution should happen to be swallowed, it will be a benefit rather than a disadvantage to the patient. This swabbing should be repeated twice a day. The child's body should also be sponged night and morning with the same solution. This will destroy the infusoria, and thus relieve the throat and mucous

membrane of the irritating cause. It will also deaden the eruption of the skin, which is also keeping up the irritation and promoting the fever.

The following is to be taken in teaspoonful doses, every hour, until the fever subsides:

℞ Fld. Ex. Asclepias	ʒj.
Fld. Ex. Cypripedium	ʒj.
Syrup Zingiber	ʒvi.

M.

This treatment, with the wash of tincture of myrrh, is sufficient in ordinary cases, without the use of emetics. It is only for the relief of the throat and for the relaxation of the system that I use the emetics.

With the treatment here presented, there should be no difficulty in curing the most malignant forms of Scarlet Fever, provided the treatment is commenced before the contagion has completely overwhelmed the *vis vitæ* of the system.

MEASLES OR RUBEOLA.

This is an eruptive disease occurring in childhood. It sometimes attacks grown persons—and usually more severely than children. Like scarlatina, one attack will generally secure the individual against the same disease again.

Symptoms.—The symptoms at first are very similar to ordinary catarrh, commencing with chilliness, running of the nose, red and watery eyes, slight soreness of throat, cough, soreness and pain in chest, difficult breathing, great heat and thirst, nausea, headache and sneezing are the prominent precursory symptoms. These symptoms continue four or five days, after which the eruption makes its appearance. It commences generally upon the face, usually the forehead, and gradually extends downward to the neck, breast, back, and finally to the lower extremities. The more profuse the eruption the higher the fever, which continues unabated un-

til the eruption begins to subside; which is usually in four or five days. On the ninth day, they disappear, when bran-like scurf is cast off from the skin. During the course of the disease, the cough is troublesome, which is occasioned by the contagion attacking the air passages.

The eruption makes its appearance in small scattered red spots, in the centre of which spots we find a small pimple, looking like small flea-bites, about the size of a small millet-seed. These, as they grow, unite into red spots. They rise above the skin, and feel rough if the hand is rubbed over its surface.

Measles may occur at any time from three days to three weeks after the child has been exposed to the contagion. It, however, usually occurs from the seventh to the fourteenth day.

Measles may be mistaken for an eruption occurring in dentition, accompanied with the usual symptoms of cold, such as sneezing, running of nose, redness of eyes, etc. The eruption which resembles measles, usually makes its appearance on a different part of the body from measles, commencing first on the back and stomach. The eruption is of comparatively little consequence, and depends on derangement of the stomach or bowels. With proper treatment and diet, it will disappear in twenty-four hours.

The difference between Scarlet Fever and Measles is well marked.

The primary symptoms of Measles are sneezing, running of nose, cough, hoarseness, red and watery eyes. These are wanting in Scarlet Fever.

The eruption from Measles appears in spots looking like flea-bites, which run together in patches of a semilunar shape, while Scarlatina-rash consists of minute pimples, diffused all over the body, producing a bright red color. There is also a roughness of the skin in Measles which is not observed in Scarlatina. The color of the eruption is also different—Measles being of a purplish or *dark scarlet*, while

Scarlet-rash is of a *light* scarlet color. There is a form of Measles called *Rubeola Nigra* or Black-measles. They depend upon a low condition of the vital powers of the system. A similar condition of system is observed in Malignant Scarlet Fever.

Cause.—Like all other contagious diseases, Measles depends upon a species of Infusoria which locates in the air-passages, and are there nourished as in Scarlet Fever. They pass out under the epidermis as in Scarlet Fever, or they may pass into the air-passages and lungs, and thus produce inflammation, and plant the seeds of Consumption, particularly when they occur in grown persons with weak lungs.

If the vital powers of the system are low, they exert a greater influence, while the symptoms are likewise more violent.

Treatment.—Measles, in ordinary cases, require but little medical treatment. The only danger to be apprehended is from the damage which may be done to the lungs by the passage of the infusoria down into the air-passages.

If there is much fever give freely of pennyroyal tea containing a little ginger. Keep the patient warm and avoid cold draughts of air.

After the eruption disappears in measles, the skin is often found to be harsh and dry. If a tepid bath be taken and the skin well rubbed, it will change its character and afford great relief to the patient.

When the eruption disappears and leaves a dry, hacking cough, it should be removed as speedily as practicable, otherwise it may induce obstinate bronchial inflammation and consumption.

CROUP.

It is only within the present century that distinction has been made between Whooping-cough, Asthma, Bronchitis and Croup. Formerly they were regarded as one and the same complaint. By the light of modern science, however,

we are enabled to distinguish a marked difference between these varieties of disorders.

Under the old treatment of blood-letting and other depletions, Croup becomes a formidable disease. By the modern method it may be readily subdued and eradicated. It is a disease that seldom occurs after the age of eight years.

Cause.—Croup sometimes appears to be an epidemic, and is more prevalent in low, ill-drained localities. Exposure to cold damp wind is a frequent cause. If a child is attacked once with the Croup it is apt to occur again. The attack seems to leave a susceptibility in the lining membrane of the larynx, trachia and bronchial tubes.

Symptoms of Croup.—Croup is usually divided into two forms—*Catarrhal Croup* and *Pseudo membranous or false membranous Croup*. These two forms may exist at the same time, and it is difficult to distinguish them in the commencement of the disease.

CATARRHAL CROUP—sometimes called *Spasmodic Croup*—usually develops itself suddenly. The child, on waking from sleep, gives utterance to a peculiar, shrill-sounding cough, somewhat similar to the crowing of a cock. Sometimes it is preceded with a dry cough and hoarseness for some days previous. There is considerable dyspnoea, or difficult breathing, which is very distressing. The voice is also rough and hoarse.

PSEUDO, OR FALSE MEMBRANOUS CROUP sometimes assumes this form from the commencement. At other times it is ushered in with the symptoms of Catarrhal Croup, and thus it is impossible to distinguish them until the false membrane has commenced forming, when the voice becomes whispering, and the cough changes from a ringing or sonorous to a husky sound.

Whenever the voice cannot be raised above a whisper and the fauces reveals white patches of exudation, we may be assured that it is the worst form of Croup. As the disease advances there is great difficulty in breathing, much anxiety

of countenance, and an impossibility to raise the voice so as to be distinctly understood, with swelling of the throat.

Treatment.—As soon as Croup is detected, which is generally at night, about or little after midnight, the child should be immediately taken into a warm room and placed in a tub of warm water, about blood-heat.

For spasmodic or catarrhal croup administer every fifteen minutes ten drops of tincture of lobelia in sweetened water. To prevent a return of the attack, keep the bowels open and give light diet.

In membranous croup, add five drops of essence of ginger to the lobelia, and apply externally to the throat equal parts of tincture of lobelia and tincture of capsicum.

WHOOPIING COUGH.

Writers generally recognize three distinct stages of whooping cough.

1st. *Forming Stage.*—The symptoms are similar to ordinary catarrh, such as sneezing, dry cough, watery eyes, headache, oppression in the chest, fever, etc., which continue two or three weeks, when the second stage commences. This is called—

2d. *Convulsive Stage.*—During this stage the cough is paroxysmal, of a convulsive and suffocative character. The peculiar hoop is caused by the spasmodic contraction of the glottis, giving rise to suffocation and difficult respiration during the paroxysm. The paroxysms of coughing usually continue from one to five minutes, at the termination of which there is usually vomiting and expectoration of ropy mucus. The convulsive stage generally lasts from five to six weeks, when the third stage commences, which is called the—

3d. *Declining Stage.*—At this stage the symptoms are less severe and the paroxysms less violent, and in the course of two or three weeks the disease disappears.

Causes.—The causes, like those of scarlet fever and measles, is dependent upon a peculiar miasma, that effects the individual but once in his life-time. The system is made susceptible to the influence by colds, diseases of the respiratory organs, debility, fatigue, etc. When the disease occurs at the latter end of the Spring, it usually runs its course with comparative mildness. When it commences at the latter end of Autumn, during the winter, or beginning of Spring, it is more trying to the patient—the Eastern and Northerly winds aggravating the cough and keeping up the irritation of the air passages.

TREATMENT.—The following prescription will be found invaluable and should be used throughout the second and third stages:

℞ Fld. Ext. Castenea ℥j.
 Fld. Ext. Lobelia ℥ss.
 Syrup of Zingiber for ℥viii.
 M. Dose: One teaspoonful four times a day.

Give the child plenty of fresh air and sustain with a light and very nourishing diet.

If the paroxysms are violent and cough troublesome, the dose may be gradually increased to two teaspoonsful three times a day.

In all cases the clothing must be abundantly warm and worn rather loose.

CATARRH IN CHILDREN.

This disease consists in inflammation of the mucous membrane of the lungs and bronchial tubes. It is a disease, liable, improperly treated by blood-letting and other reducing means, to terminate fatally.

Symptoms.—The disease generally commences in the nostrils, and gradually extends to the fauces, larynx, trachea, bronchæ, and in children, to the lungs, causing pneumonia and inflammation. It is generally at first attended with dry

cough, sometimes difficult breathing, and suffocation when it extends to the lungs. Most mothers are so familiar with the symptoms of ordinary catarrh, that a further description of them will not be necessary.

Treatment.—When the disease first commences the feet should be soaked in warm water, and the following remedy given:

Take pleurisy root, one ounce; ginger, one-fourth ounce; steep in one pint of hot water, strain and sweeten; give one tablespoonful every two hours till relieved.

If the cough be severe with difficult breathing, a spice plaster should be applied, so as to cover the entire breast, and allowed to remain until the symptoms subside.

THRUSH, OR BABY'S SORE MOUTH.

This is a disease to which infants are particularly liable within the first and second months, or the first year after birth. It is an ulcerative sore mouth, and first makes its appearance with a redness of the surface of the tongue and around the gums, and great dryness of the mouth. Soon whitish spots appear, which may increase until they cover the entire surface of the mouth. If this state continues for any length of time, the general health becomes affected, and we have the disease extending to the stomach and bowels, producing diarrhœa, with feverishness and emaciation.

Causes.—Want of cleanliness is generally the cause of this disease. The mouth of the child should be washed out with a wet rag, after every meal, especially if nursing from a bottle. Feeding the unfortunate infant with sugar and molasses, or allowing it to suck little bags of sugar and bread, are other causes.

Treatment.—The most important thing is to keep the mouth of the child *clean*. A few grains of borax dissolved in a teacup of water and used as a wash will generally be effective. A very nice application is to dissolve half a drachm of borax with one drachm of glycerine and one ounce of water. These may be used in a mild attack

CHAPTER XXIV.

DISEASES OF FEMALES UNATTENDED WITH PREGNANCY.

WITHOUT a thorough acquaintance with the structure and functions of the reproductive organs, it will be impossible to comprehend and properly treat the many diseases or complications of derangements to which they are liable. These have been very clearly explained, and further elucidated by numerous engravings, in the preceding pages of this work, so that any female of ordinary intelligence and judgment will be able to readily master a majority of the complaints incident to the sex, without the special assistance of a medical practitioner.

DIVISION I.

DISEASES OF THE EXTERNAL ORGANS OF GENERATION.

DISEASES OF THE LABIA.—The labia are liable to inflammation from acrid discharges, syphilis, gonorrhœa, etc.

Symptoms.—Where there is much inflammation there is heat, swelling and throbbing, attended by fever. From the looseness and vascularity of the texture, the progress of inflammation is generally rapid, soon terminating in suppuration.

Treatment.—As the movement of the parts causes pain, the female should confine herself to bed. If the bowels are constipated, they should be opened by injections. Where there is a tendency to suppuration, the abscess should be opened on the inside of the lips and the pus pressed out.

Should the parts not incline to heal, a solution of sesqui-

carbonate potassa, one drachm to four ounces of water may be used, injected into the abscess.

Abscesses of the labia sometimes terminate in fistula. In such cases the advice of some skilful physician will be necessary.

IRRITATION AND INFLAMMATION OF THE VULVA IN CHILDREN.—Children are liable to an irritation of the lips of the pudendum or vulva. This will terminate in inflammation and give much trouble, if not promptly rectified.

Symptoms.—Stinging and burning sensation, redness of the lining membrane of the external labia and vulva, with a white discharge—leucorrhœa or “whites.” Urination increases the soreness and smarting, causing the child to cry and retain the urine.

Treatment.—Wash the parts well with Castile soap and water two or three times a day, wiping dry. Afterward apply freely the oxyde of zinc ointment or a solution of sulphate hydrastia, one grain to an ounce of water, to the irritated surface. This may be done after each washing, if necessary.

PRURITUS, OR ITCHING OF THE VULVA.—This attends inflammation and other disorders of the vulva. It may occur from pregnancy, from disease of the neck of the womb, from leucorrhœa, and diseases of the bladder and rectum. It may also occur from seat-worms, and from diseases of the roots of the hair on the external labia.

Symptoms.—Tormenting irritation of the vulva, extending into the vagina and meatus urinarius. The itching is increased by the warmth of the bed, fatigue from walking, stimulating food and drinks. If the parts be examined there will be found small, slightly elevated pimples. These being scratched with the nails, causes a slight acrid bloody discharge from them, and the surrounding parts to be highly inflamed. Sometimes the irritation is so great as to excite the venerous or erotic passion to a degree that cannot be restrained, amounting to mania. The health will

soon give way under the inflammation and swelling, the constant irritation, the loss of sleep and appetite, watchfulness, etc.

Treatment.—First ascertain the cause and then seek to remove it. The cause may depend on some morbid condition of the bladder and rectum, or of the vagina.

The following local application will generally answer the purpose to allay the irritation:

℞ Sulph. Hydrastia	gr. v.
Borate of soda	ʒss.
Rose water	ʒiv.

Mix—Apply twice a day with a piece of sponge, first washing the surface with soap and water, wiping dry.

Should there be any abrasion of the mucous membrane of the vulva, the ointment of oxyde of zinc may be applied night and morning.

When the general health has suffered, tonics will be requisite, such as cinchona, etc., accompanied with a nourishing diet, avoiding stimulating food and drinks, and keeping the parts strictly clean.

There are many other diseases of the external organs of generation, together with various forms of morbid growth, but as they will require the aid of an experienced physician, it is unnecessary to present them in this volume.

DIVISION II.

DISEASES OF THE VAGINA.

IMPERFORATE HYMEN.—The existence of an imperforate hymen is not generally noticed until the age of puberty. At this time the female may have all the symptoms which accompany menstruation without the discharge. There will then be a sense of weight and fullness in the vagina and an enlargement at the lower part of the abdomen, just above

the pubis. When these indications are observed, an examination will readily detect whether they are occasioned by an imperforated hymen or otherwise.

Treatment.—The hymen must be divided or an aperture made. This operation is not attended with pain. The vagina should then be syringed with tepid water and the recumbent position observed until the right position of the organ be regained.

VAGINITIS, OR INFLAMMATION OF THE VAGINA.—Inflammation of this organ may be confined to the lining membrane, or it may extend to the subcutaneous tissue.

Symptoms.—Sensation of weight and fullness in the vaginal canal; pain and redness of the part. The speculum will reveal redness and swelling of the lining membrane, which is tender to the touch. At first there is no discharge. After a few days there is a thin serous secretion, which finally becomes yellowish, or greenish, or purulent. It is difficult to detect this discharge from that of gonorrhœa. It is very important, however, to do so, in order to protect the character for chastity of the individual afflicted. The discharge of gonorrhœa can only be detected from that of vaginitis by the aid of the microscope. No physician should dare pronounce the discharge gonorrhœal without such microscopic examination.

Causes.—It may result from cold, excessive sexual indulgence, child-bearing, stimulating food and drink, gonorrhœal virus, etc.

Treatment.—Warm hip-bath and injection of cold water into the vagina. If the discharge is excessive, procure a solution of five grains sulphate of Hydrastia, ten ounces of water; two ounces to be injected three times a day. The bowels are to be kept regular.

When the vaginal discharge has ceased, cleanliness must be maintained, using frequent injections of cold water, mixing occasionally a little Castile soap with it.

LEUCORRHOEA, OR WHITES.—After the age of puberty

this is one of the most frequent complaints of females. It is a discharge from the cervical glands, and the follicles of the uterus, and vaginal and lining membrane, of a white, yellow, greenish or purulent character, the result of inflammation.

Symptoms.—The general symptoms in connection with the discharge are as follows: The face assumes a pale and yellow or sallow color; the eyes are surrounded by dark, leaden-colored circles; a dragging and weary sensation in the left side; dull pains in back and loins; nausea and loss of appetite, with more or less distention of stomach, palpitation of the heart, difficulty of breathing at times, loss of sexual desire; pain in the head, located generally on top or back part; lassitude, general debility, etc.

There are two distinct forms of leucorrhœa, each requiring a distinct treatment. The first is called *cervical leucorrhœa*, the discharge taking place from the glands and follicles of the cervix of the uterus. The other is called *vaginal leucorrhœa*, the secretions flowing from the lining membrane of the vagina.

1. *Cervical Leucorrhœa.*—The discharge from the cervix is a clear transparent mucus, of an alkaline reaction when it comes in contact with the secretions of the vagina, which is acid. It is coagulable and resembles curdled milk. Sometimes it is mixed with pus and becomes purulent; or it may be mixed with blood, from the bleeding of the mouth of the womb, resembling menstrual secretions, and as often mistaken for such. Frequently the discharge is so great as to cause a drain upon the system and undermine the constitution.

2. *VAGINAL LEUCORRHOEA.*—The discharge is entirely from the vagina. Sometimes it will affect the glands of the cervix sympathetically, thus combining the two forms in one. In vaginal leucorrhœa the discharge consists of an acrid mucus, with patches and threads of epithelium or lining membrane. These patches are occasionally as large as

a walnut rolled up. The organ will be found covered with a white coating, which may be removed with the forceps.

The cervical discharges produce an abrasion of the neck and mouth of the womb, stripping off the entire surface of the villi or lining coat, causing it to present a red, inflamed and velvety appearance, often mistaken for ulceration of the os uteri or head of the womb. On the advance of the disease, there will be a granular condition and ulceration finally. Cervical ulceration, in cervical leucorrhœa, is always occasioned by the cervical discharge.

Taylor Smith lays it down as a rule that cervical leucorrhœa can rarely exist without inducing disorders of the os uteri. Accordingly the only plan of treating such cases successfully is to suppress the cervical discharge.

The secretion from the cervix may also cause the vagina to present a similar condition of a red velvety appearance and a peeling off of the lining membrane. This may extend the whole length of the vagina—give great pain in sexual intercourse, and suffering in walking and during menstruation. What is called irritable uterus is no doubt caused by leucorrhœa, attended with a neuralgic condition of the cervix and os uteri.

The symptoms of both are the same, as nausea, constant dyspepsia, and pain in the back, left side of the chest, groin, extending down to the thighs, etc.

Leucorrhœal discharges have a very slight fetid odor, unless there be considerable purulent discharge from deep-seated abscesses. In cancer, the discharges are so fetid as to scent the whole room in which the patient is confined.

It is a very difficult matter sometimes to detect secondary syphilitic ulceration from ulcerations produced by long-continued cervical discharges. Such is also the case in gonorrhœal discharges from the cervix. The treatment for leucorrhœa will not have any effect upon either syphilis or gonorrhœa. Should the treatment for leucorrhœa fail, it

would be well to have the advice of some regularly qualified physician.

Leucorrhœal discharges, it is proper to remark, will sometimes cause *Balanitis*, or irritation of the glans penis, as well as urethral irritation and a secretion resembling gonorrhœa, which discharge from the male urethra coming in contact with the healthy mucous membrane of the vagina, may also cause severe gonorrhœa in the female.

This form of disorder in the male has been denominated *abortive gonorrhœa*. It is a question whether gonorrhœa is not often communicated or propagated in this way. I have seen and treated cases which seem to confirm this view. Such cases yield more readily to treatment than those of a confirmed character.

Cervical leucorrhœa interferes with menstruation, and causes abortions. Both the vaginal and cervical leucorrhœa, likewise, will produce sterility—the acrid and purulent secretions of the female killing the spermatozoa of the male as soon as they are brought in contact with them.

CAUSES OF LEUCORRHOEA.—Pregnancy, over-sexual excitement and sexual intercourse, decline of life in plethoric persons or those of full habits; debility is a frequent cause; also depressing emotions, long fatiguing walks, indigestion, cold, etc. A common cause is lactation, or nursing, occurring with some females every time the child is nursed. Scrofulous and consumptive persons are liable to it. Residence in warm climates, by relaxing the system, will cause some of the worst forms of leucorrhœa, while piles and constipation often induce the complaint. Leucorrhœa is also hereditary. Children are liable where the mother has suffered long from the disorder.

Treatment.—First discover the cause, before commencing to remove the difficulty. Next seek to improve the general system, by a tonic treatment. Calisaya is one of the best tonics that can be given.

Injections.—Before injecting, it is of the utmost impor-

tance to have a proper syringe. The ordinary glass or metallic syringes are of little use. The syringe should be so constructed that a large quantity of liquid may be thrown up the vagina at a time. There are various forms of gutta percha and india-rubber syringes which answer admirably. The kind which I have used and recommended for several years past, is so constructed that a constant stream may be injected without removing the syringe. It is the best kind I have seen employed.

In profuse cervical leucorrhœa, the vagina should be well syringed with cold water, and the following preparation injected:

By this method the most satisfactory results may be obtained in two or three weeks.

In severe forms of leucorrhœa, injections cannot be dispensed with. They not only arrest the discharge, but give tone to the uterine walls and cervix uteri, removing at the same time much of the depressed feeling of the patient.

VAGINAL LEUCORRHOEA.—The constitutional treatment of vaginal leucorrhœa is similar to that of the cervical.

The injections, instead of being acid, should be alkaline, on account of the discharges being of an acid character.

Copious injections of cold water will prove of great avail in allaying irritation, removing the acid secretions, and in giving tone to the walls of the vagina.

Where the vaginal leucorrhœa has existed a long time, the parts will become so much relaxed as to cause prolapsus or falling of the womb. In such instances, cold injections will overcome the relaxation and give tonicity to the parts.

The injection I generally use is the following:

℞ Bi-carbonate soda	℥ss.
Bi-carbonate potash	℥ss.
Water	℥ quart.

Inject half night and morning.

Or

℞ Solution of Sulph Hydrastia ℥ij.

Water i quart.

Inject half night and morning. Or the two may be alternated with daily.

If the disease still proves obstinate, some vice of the system may be suspected. In such cases the following should be given:

℞ F. Ext. Stillingia comp. ℥ss.

Simple syrup ℥iv.

Dose—One teaspoonful three times a day, in water.

In connection with this treatment the patient will require a moderate amount of exercise in the open air, with a rich stimulating diet, while the cold and tepid hip-baths should not be neglected. Sexual intercourse must be strictly avoided and only moderately indulged in after the subsidence of the disease, or the same condition may be induced.

As leucorrhœa is a disorder that requires a nice discrimination in adopting a proper treatment, it might be well in all cases to apply to some skillful physician for preliminary advice, before undertaking its management.

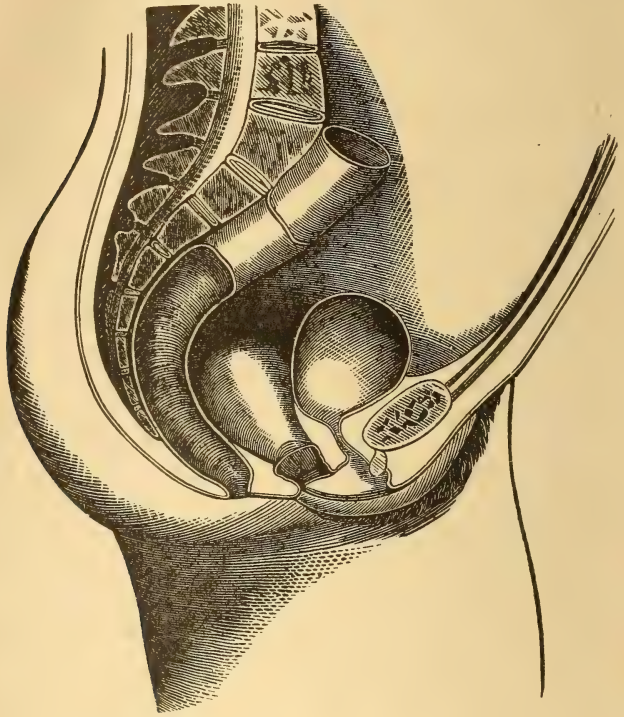
DIVISION III.

DISEASES OF UTERUS AND FALLOPIAN TUBES.

PROLAPSUS, OR FALLING OF THE WOMB.—This is the most common form of displacement. By reference to the second Chapter of this work, the reader will find a succinct description of the four ligaments which are intended as partial support to the uterus in the pelvis. These are called round, broad, utero-sacral and utero-cervical ligaments. The uterus is also partially supported by the vagina, and the relaxation of its walls is always sufficient of itself to cause more or less prolapsus. Dr. *Ashwell* maintains that the ligaments afford but very little protection and support to

the womb, for this organ may be drawn down without putting it on the stretch. He contends that the bladder, rectum, vagina and muscles lining the pelvis are the main supports to the uterus. (*Fig. 68.*)

FIG. 68.

PROLAPSUS OR FALLING OF THE WOMB. (*From Scudder.*)

Symptoms.—The symptoms will vary with the extent of displacement. There is usually a dull heavy pain in the small of the back, and a dragging weight in the pelvis and at the lower part of the rectum. These feelings are increased by exercise or by being long on the feet. These symptoms are relieved by lying down. When the prolapsus is very great, these indications are more prominently

marked. There is also a pain and a feeling of distress in the groin, extending down the thighs, caused by pressure on the sacral nerves. The sensation of weight in the pelvis and groin, at times, is so great that the patient imagines "everything is dropping through." There is frequent desire to urinate and evacuate the bowels. Sometimes the micturition is only a few drops, in consequence of the distressing irritation of the bladder. Other parts of the system besides those immediately surrounding the pelvis are sympathetically affected. Headache, a dejected and distressed expression of countenance, with an inclination to bend the body forward, are also characteristics of prolapsus. (See *Figs. 68 and 70.*) There is loss of appetite with dyspeptic symptoms. The distention of the stomach is so great that the female is compelled to loosen her dress. She expresses herself as being swelled. She has palpitation of the heart, pain in the left side sometimes attended with a slight cough and leucorrhœa.

Causes.—If we glance a moment at the support of the uterus, we may readily perceive that so long as the parts are able to resist the constant action of the diaphragm and abdominal muscles, there cannot, as a general rule, be prolapsus. Whatever tends to relax and debilitate the general system may cause the complaint. The abdominal muscles which support the abdominal viscera are more or less relaxed by a debility of the system. By relaxation and without drawing of support from the abdominal viscera, the bowels are allowed to press upon the pelvic viscera and tissue which support the uterus, and in consequence of this constant pressure it gives way. *Fig. 71* shows the natural position of the viscera when there is no relaxation of the abdominal muscles, and *Fig. 72* when there is relaxation and displacement of the womb. Another frequent cause is too early exercise after child bearing. Inflammation of womb, particularly of the cervix, increasing the bulk and weight of the organ, is also a common cause. It is likewise produced by danc-

FIG. 69.



FIG. 70.



APPEARANCE OF A FEMALE LABORING UNDER A FALLING OF THE WOMB AND DRAGGING CONDITION OF THE VISCERA. [*After Benning.*]

ing, leaping and jumping, particularly during the period of menstruation, when the organ is naturally increased in weight from the congestion concomitant of the catamenial flow.

Treatment.—First remove the cause. If the abdominal muscles are relaxed, an abdominal supporter is indispensable, in order to support the viscera and take the pressure from the pelvis. Supporters are strongly condemned by some practitioners. Unless they fit properly, they are worse than useless. If properly made, however, they afford great relief, and those accustomed to them cannot be induced to forego their employment.

Supporters have been recommended by manufacturers as applicable to all uterine diseases. Hence the abuse of them has led to their condemnation in toto. If we condemn all good and useful articles because they are liable to be abused we would soon discover our error. I recommend the supporter in all cases of relaxation, and never engage to treat until one is procured. The supporter should be as uncomplicated as possible, made of steel with front and back pads. Some are quilted and padded to such an extent as to be really injurious, by keeping up too great a warmth of the parts.

Tonics should be used to strengthen the general system. The following compound may be used for this purpose:

℞ Sulphate cinchonaxxv grs.
Citrate iron, (soluble)..... xxxv grs.

Make into twenty-four powders. Take one three times a day, after each meal, in sweet wine.

To give tone to the pelvic viscera, the cold hip-bath should be used once a day, followed by friction while injections of cold water into the vagina must not be omitted. If there be any discharge, inject a solution of alum, one ounce to a pint of water. This will arrest the secretion, and at the same

time harden and strengthen the vagina. Observe the recumbent position as much as possible, and avoid becoming fatigued. Cold bandages applied on going to bed and allowed to remain on all night, are also very efficacious.

The chief difficulty to overcome is the pressure around the waist by the use of corsets and wearing heavy skirts. Such pressure must be removed. The clothes should be loose and be suspended from the shoulders. Attention to this requirement cannot be too strongly impressed upon the mind of the patient.

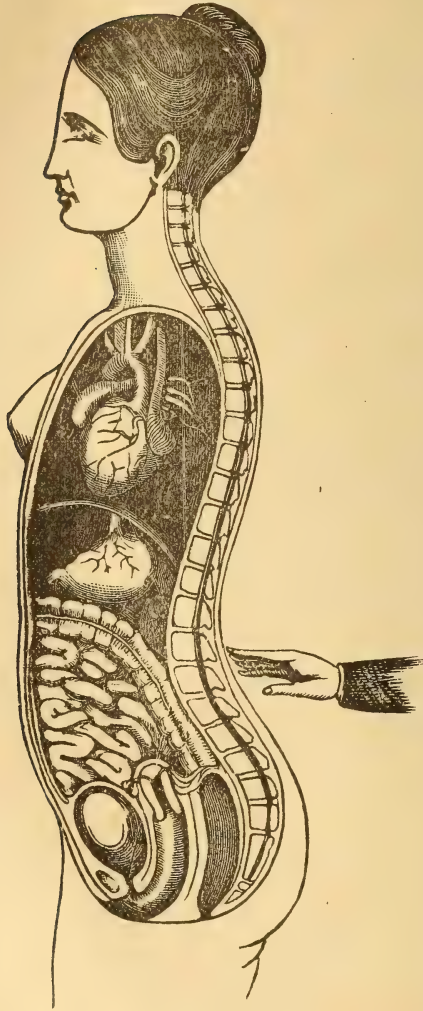
The use of pessaries I utterly reprobate. They were used by the Egyptian, Greek, Roman and Arabian physicians, and are still recommended by some of the old-school practitioners of the present day. They are made of silver, gold, wood, cork, sponge and glass. Their use is merely palliative at best, while they often produce irritation and inflammation of the os-uteri and vagina, and, by consequence, lay the foundation of more formidable diseases, such as ulceration and cancer of the womb. The galvanic battery, in some cases, may be usefully employed, in connection with other treatment in prolapsus, especially if applied by or under the direction of an experienced practitioner.

RETROVERSION, OR RETROFLEXION OF UTERUS.

This is a displacement not so common as prolapsus. It may occur both in the pregnant and non-pregnant female. (*See Fig. 73.*) The uterus is here thrown back, the fundus resting against the rectum.

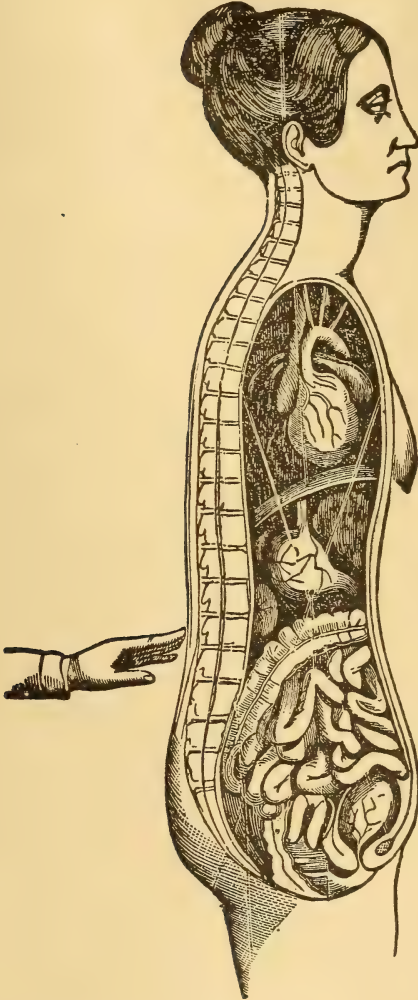
Symptoms.—If the retrocession is slight, there may be no well-marked symptoms. In other cases, the symptoms are dyspepsia and hysteria, and sometimes severe neuralgic pains in the breasts and along some portion of the spine; difficult breathing. Constipation is a common attendant; the uterus pressing against the rectum preventing the ex-

FIG. 71.



REPRESENTATION OF A HEALTHY, ERECT, AND WELL-PROPORTIONED FIGURE. THE SPINE HAS THE NATURAL CURVES, AND THE ABDOMINAL VISCERA IS PREVENTED FROM PRESSING UPON THE WOMB, RECTUM AND BLADDER BY THE ABDOMINAL MUSCLES.

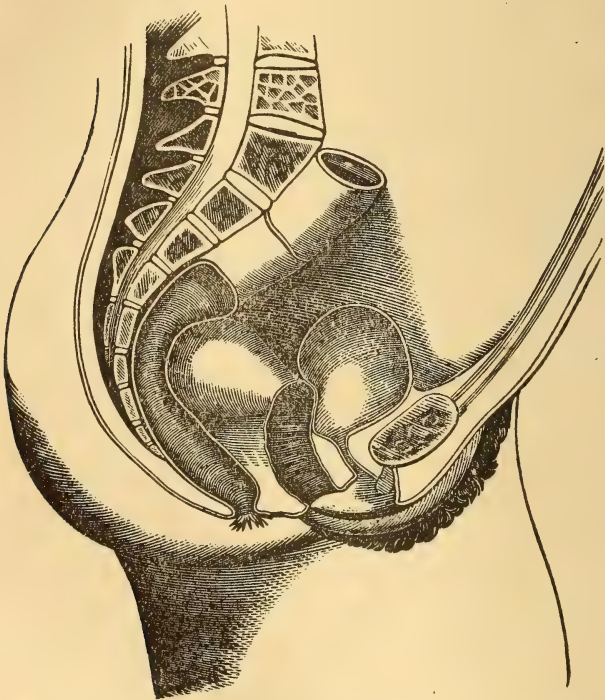
FIG. 72.



REPRESENTATION OF A RELAXED, DROOPING, AND BADLY-PROPORTIONED FIGURE, WITH THE LUNGS AND STOMACH DRAGGED, AND THE WOMB, BLADDER, RECTUM, AND BLOOD-VESSELS OF THE PELVIS AND LEGS COMPRESSED BY THE FALLING OF THE BOWELS, FROM THE RELAXATION OF THE MUSCLES OF THE SPINE AND ABDOMEN.

pulsion of the fœcal matter there accumulated. Sometimes there is a mucus discharge from the bowels, produced by the irritation, while the retention of urine is not unfrequent. There may also be pains in the loins, extending down the lower extremities, causing fatigue in walking or standing.

FIG 73.

**RETROVERSION, OR FALLING OF THE WOMB BACKWARD AGAINST THE RECTUM.**

Causes.—Pregnancy, weakness of uterine support and increased weight of the fundus of the uterus, falls, sudden shocks, distended bladder, tumors in the uterus, such as polypi, which are usually attached to the fundus.

Treatment.—First restore the organ to its natural position. This may sometimes be done by passing two fingers up the vagina, and pressing between the cervix-uteri and rectum, at the same time drawing down the uterus with some instrument like the blade of a forceps.

Another plan is to pass a uterine sound into the uterus and turn the instrument so as to look toward the bladder. If used with care little or no pain will be produced. Before displacing the uterus the bladder should be emptied, either by natural means or by the catheter.

In cases of pregnancy the sound cannot be used. Draw off the urine and empty the rectum by an enema. Then pass one finger into the rectum so as to reach the fundus, and press up the canal of the intestines. By continuing gentle pressure, the uterus will suddenly emerge with a sort of jerk.

Sometimes it is necessary to have recourse to instruments. Dr. *Bond's* instrument answers a very good purpose. So does M. *Gariel's* Air Pessary, which distends the rectum, and by that means overcoming the displacement.

After the womb is replaced, the patient should maintain a horizontal position, the bladder must be kept emptied, while cold water injections in the vagina are not to be omitted, provided pregnancy does not exist, as this will give tone to and reduce the congestion of the organ. The cold bandages may also be worn, and if the system is much relaxed and debilitated, one of the iron mixtures mentioned in the pages on Prolapsus may be given.

ANTEVERSION OF THE UTERUS.

This displacement is quite the opposite to that just described—the fundus being against the bladder and the mouth toward the rectum. This form seldom occurs.

Symptoms.—Similar to those given of retroversion, though not so well marked. The most prominent symp-

tom is a constant desire to urinate but difficulty in voiding the urine.

Causes.—Accumulations in the rec'um, tumors attached to anterior wall of uterus, tilting it over, relaxation, a blow, fall, etc.

Treatment.—The displacement is much easier than in retroversion. The patient should lie on her back, with her hips considerably elevated, when the uterine sound is to be used, as in the last form of displacement. Prof. *Godfrey* recommends the patient to be placed on the side of the bed, with the head and hands on the floor, and the thighs and legs resting on the bed. In this position the intestines are drawn down toward the diaphragm, the pelvis becomes somewhat emptied, while the uterus being pressed upon assumes its natural position. When this is accomplished, the bladder should be kept partially distended for some time afterward.

The other treatment is similar to that in other forms of displacement.

INFLAMMATION OF OVARIES AND TUBES.—Diseases of the Fallopian tubes are said to be more common than inflammation of the ovaries. Where the tubes are much inflamed, thickening may occur, while there may also be a discharge similar to what is observed in inflammation of the uterus.

Symptoms.—Dull aching pain in one or both iliac regions, accompanied by sensations of weight and heat; pain and soreness on pressure in the region of the Ovaries, with some fever, which is almost always intermittent.

Causes.—Cold, blows in the region, over-sexual indulgence, suppression of menses, etc.

AMENORRHOEA, OR OBSTRUCTION OF MENSES.—Two thirds of menstrual irregularities are included under this heading.

I. *Suppressed Menstruation*.—By this is understood those cases in which the menses have once occurred and been suppressed through some cause or other.

Symptoms.—They differ materially in different persons. With some there is slight headache, a feeling of weight about the pelvis, pain in back and loins. In other cases these symptoms are more strongly marked; attended with quick pulse, hot skin, fever, inflammation of uterus, and frequently hysteria. Sometimes Nature relieves the system by the nose, lungs, stomach and bowels, eliminating blood, quite often in a profuse hemorrhage, or if not copious, lasting for several days. Blood has been known to be discharged in such cases from the axilla, ears, mouth, gums, fingers, toes and from ulcers upon the body. Sometimes the discharge will not cease entirely, but become less in quantity and lighter in color at each succeeding monthly period, and generally preceded and followed by leucorrhœal discharges.

Causes.—One of the most common causes is cold during the menstrual period, from getting the feet wet, sitting on the damp ground, sleeping between wet sheets and wearing damp clothes, severe mental emotions just previous to the monthly occurrence, coitus during Menstruation, consumption, chronic liver derangement, general debility, etc.

Treatment.—As soon as the discharge has ceased, a warm sitz-bath will often bring them on. Should there be much inflammation of the uterus, the following may be given:—

℞ F. ext. hedeoma ℥ss.

Simple syrup f ℥ij.

Dose—One teaspoonful every two or three hours.

If there be hysterical symptoms, the following will generally afford immediate relief:—

℞ Valerianate ammonia ℥iv.

Dose—One teaspoonful every one or two hours until relief is afforded.

If the discharge cannot be re-established, the patient must wait until the next period. A day or two prior to the next term, the bowels should be freely opened and kept so until the period has arrived for the discharge.

Should this treatment not answer, and there be debility of the system, it must be improved before the function can be restored. This is particularly the case in consumption, scrofula, hepatic diseases, etc. If there be no apparent derangement of the system except that produced by the suppression, an examination should be made of the uterus, for inflammation and ulceration of the cervix will often cause suppression of the menses.

Should there be no assignable cause and the general health be good, the function should be forced, providing there is positive assurance that the female is not pregnant.

ABSENT MENSTRUATION.—The usual period for menstruation is from the thirteenth to the sixteenth year, at which time the female is said to have arrived at puberty. In larger towns it occurs much sooner than in rural districts. Those brought up in luxury or sexual indulgence experience these changes sooner than those reared in hardihood and self-denial. Before or about the period of puberty, the organs of generation undergo a change. They increase considerably in size; the breasts enlarge, and other changes occur, the most striking being the catamenial flow.

Physicians acquainted with the functions of the reproductive organs never attempt to force the menses providing their non-appearance causes no derangement of health, for there may be all the evidences of puberty with the exception of the discharge. This may be owing to some malformation similar to that spoken of in the chapter on Hermaphroditism. This, however, is not a frequent occurrence.

Amenorrhœa may be occasioned by an imperforated hymen, as spoken of in a previous part of this chapter. It may also be occasioned by some congenital malformation

in the vagina or os uteri. This should be ascertained before the function is forced. Our purpose is only to speak of amenorrhœa existing with a fully developed body and sexual organs.

Symptoms.—Headache; weight, fullness and throbbing in the center of the cranium and back part of the head; pain in back and loins; cold feet and hands, becoming sometimes very hot, skin harsh and dry, slow pulse and not unfrequently attended with epilepsy.

Treatment.—About the period when the system is sympathizing the most, and there is evidence of its approach, the warm hip bath should be taken twice a day and cloths wrung out of warm water applied over the pubis or lower part of the abdomen. The bowels must be kept open by some gentle cathartic. Drastic purgatives should be avoided. During the menstrual discharge the following may be used, to relieve pain and fullness of head and promote discharge:—

℞ Tinct. anthemis	ʒi.
Tinct. cimicifuga	ʒss.
Syr. simplex	ʒiv.

Dose—One teaspoonful three times a day. If the pain is severe, it may be taken every two hours.

During the interval, if the system is not vigorous and robust, the following may be taken:—

Elixir pepto-mangan.

Dose—Two teaspoonsful three times a day.

DYSMENORRHOEA, OR PAINFUL MENSTRUATION.—This is of common occurrence in females of sanguineous and robust constitutions, and of ardent and animated temperament. The monthly discharge makes its appearance at the usual period, and in small quantity. It is often entirely suppressed for several hours. Females troubled with dysmenorrhœa are subject to frequent headache, and rush of blood to the head during the interval of the catamenial periods.

Symptoms.—Severe bearing-down pain in the uterine region, resembling labor pains; aching in small of back, loins, and lower extremities; flatulence and cutting pains in the abdomen; scanty discharge, which is coagulated and contains shreds of fibrous structure, with the clots of dry blood, and not unfrequently severe attacks of hysteria.

Causes.—Inflammation or congestion of the blood vessels of the uterus, and obstinate constipation; sedentary occupations; improper dressing; smallness of the mouth and neck of the womb, etc. Such females are almost always permanently relieved of the distressing symptoms after marriage.

Treatment.—When the attack commences, take a warm hip-bath; lie in bed and apply cloths wrung out of hot water to the lower part of the abdomen. Use the following:

℞ Tincture of caulophyllum ℥ij.
Simple syrup ℥iv.

Dose—One teaspoonful every half hour, until relieved.

During the menstrual discharge the bowels must be kept open. In the intervals of the periods constipation should be overcome, while the body should be frictionized all over with a coarse crash towel once or twice a day. Take plenty of exercise in the open air. For the constipation one or two drops of the tincture of nux vomica may be taken three times a day dropped on sugar.

This treatment will answer in a majority of cases. If it be occasioned by any mechanical obstruction, advice of a physician must be obtained. When the discharge is scanty and attended with pain and hysterical symptoms, I use in combination with the prescription one drachm of the tincture of pulsatilla.

MENORRHAGIA, OR PROFUSE MENSTRUATION.—Profuse discharges may occur at any age from puberty to decline of the menstrual period, or turn of life. In some females the



EXERCISE 22—LEARNING THE TWIST.



EXERCISE 24—SHE HAS LEARNED HOW.

discharge is always profuse, without impairment of the general health.

Symptoms.—Exhaustion of the bodily powers, weakness and pain in back, extending to the hips, thighs, and across the loins; sallow and sunken features; headache; pains in stomach and bowels; neuralgic pains in face; sometimes there is diarrhoea and nervous debility, melancholy, epilepsy, etc.

Treatment.—Maintain a recumbent position, use plain diet, and abstain from all stimulating food and drinks. The feet must be soaked in warm water, and cold cloths applied to the lower parts of the abdomen.

I have used the oil of erigeron with considerable success. I employ it according to the following prescription:—

℞ Oil cinnamon	ʒii.
Oil erigeron	ʒij.
Water	ʒiv.
Pulv. gum Arabic	ʒj.

Dose.—One or two teaspoonsful every two or three hours in sweetened water.

I have found it necessary in some extreme cases to plug the uterus. Cases that will not yield to the above treatment will require the attention of a skilful physician.

During the interval of the periods, the system should be toned up and the blood enriched.

Frictions on the surface of the body daily, and exercise in the open air, should be observed.

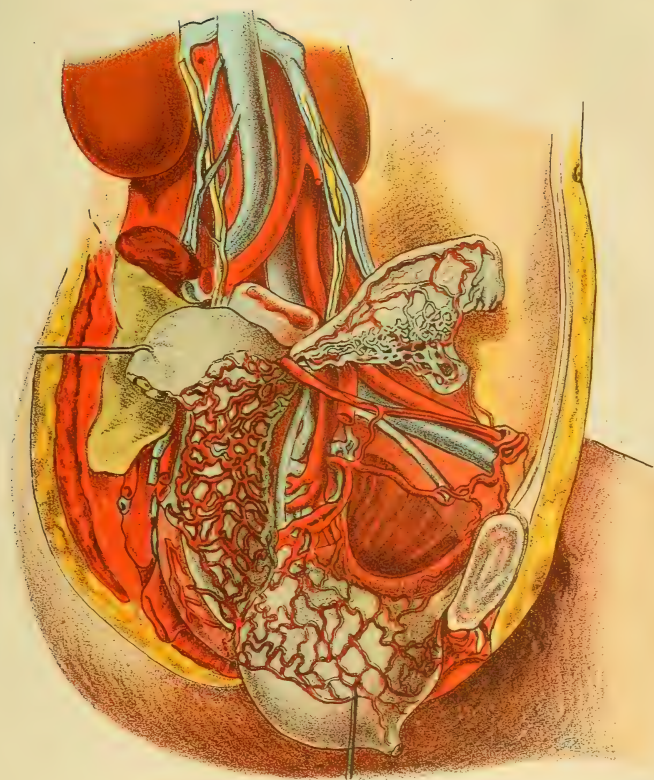
CHLOROSIS, OR GREEN SICKNESS.—This is a disease generally occurring in unmarried females of weak, delicate frame. Such as are so from birth, having feeble appetite and digestion. At puberty there is no menstrual discharge, or else it is very slight; there is an enæmia of system; the skin presents a yellowish dirty-green pallor. The disease sometimes attacks females advanced in life, and is generally preceded by leucorrhœa or menorrhagia.

This is purely a disease of the blood, and may occur in males as well as females; very seldom, however, in the former. The marked changes observed in the blood of chlorotic subjects is the diminution of the red corpuscles. The average normal amount of red corpuscles in one thousand parts is from one hundred and thirty to one hundred and forty parts. In chlorosis they are reduced to sixty, and, in some rare cases twenty-six parts in one thousand.

We may readily understand what influence such a diminution of the corpuscles will have upon the general system, when we know that their office is to convey oxygen from the lungs to the different tissues and to convey carbonic acid out into the lungs to be eliminated. Assimilation, nutrition, combustion, and, in fact, no function of the animal economy can be performed without a supply of oxygen. It is the great sustaining principle of the *vis medicatrix*, or what the general is to the army when the battle is raging.

Without red corpuscles, the system cannot be supplied with oxygen; and without oxygen all the offices of the system must be impaired, or partially suspended. It is important to understand the nature of this disease, for it is considered a fatal one. Only a small percentage of patients are cured, which I have attributed to a want of knowledge of its true pathology. Many physicians will direct their remedies for the purpose of correcting the uterine function, which is no more suffering than the others. Such treatment is sure to destroy the patient.

Symptoms.—General debility, dislike to exercise, easily fatigued, dullness, listlessness, melancholy, desire for solitude, frequent weeping without cause, poor appetite, loathing of food, desire for chalk, dirt, slate pencils, acids, pickles, etc. The breath is offensive, bowels constipated, quick pulse, palpitation of heart and more or less headache. Some split and bite their finger nails; hair loses its natural color



ARTERIES AND VEINS OF
VAGINA AND UTERIS (SAVAGE)

and falls out, and there are an almost unlimited number of other indications which would be tedious to enumerate.

Cause.—Depressed vital powers, which derange all the functions of the body. The weakness is not unfrequently hereditary, the parents laboring under a similar condition, or has been brought about by the violation of some law of the animal economy, as by masturbation, etc.; living on un-nutritious food, residence in ill-ventilated and damp apartments, etc.

Treatment.—If we take into consideration the pathology of the disease, the treatment will not be difficult. Exercise in the open air is very essential; the body should be protected from chilliness by warm clothing, and the patient should sleep on a mattress, and in a well-ventilated room. The diet should be nutritious, not stimulating; game, where it agrees, may be freely eaten. The habits should be regular, the mind kept cheerful by pleasant society, amusements, etc. The surface of the body should be sponged night and morning with the following, and rubbed dry with a coarse towel, so as to produce action in the skin.

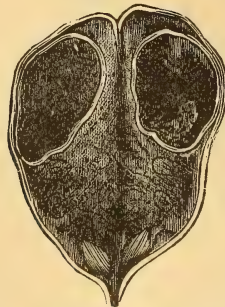
℞ Distilled witch-hazelone quart
 Cayenne pepperone teaspoonful.
 Soap sufficient to make a lather.

OVARIAN DROPSY.—By this disease is understood an accumulation of fluid in the Graafian follicles or cysts of the ovaries. The ovaries are capable of secreting an enormous quantity of fluid, but unlike other parts are incapable of re-absorbing the effused fluid, and therefore unlike general or abdominal dropsy. It matters not in ovarian dropsy how rapidly the kidneys may secrete, not the least influence is produced on the accumulation of fluid in the cysts. Although much attention has been paid to this subject of late years by the ablest American and European physicians, there is still much obscurity connected with the disease.

As there are too many forms of cystic disease to be spoken of in this volume, only the more important will receive consideration. These are the simple cysts, compound cysts, hydatid cysts, dermoid cysts, or those containing hair, teeth, bones, etc.

I. *Simple Cysts*.—The simple ovarian cyst is a simple sac, while the rest of the organ retains its normal condition. These cysts vary from the size of a pea to the bulk of the human head. This form is generally found hanging as an appendage to the ovarian ligament. The coats of the cysts become thickened, but not uniformly so, some parts being thicker than others. The outer coat consists of the peritoneum which encloses the ovaries. The proper wall of the cyst becomes thickened, and consists of dense fibrous tissue. By this increase of thickness the cyst is prevented

FIG. 74.



HUMAN OVARY CONTAINING A MORBIDLY DISTENDED GRAAFIAN FOLLICLE OR CYST IN THE INCIPIENT STAGE—THE CYST HAS BEEN DIVIDED THROUGH THE CENTRE—THE BALANCE OF THE OVARY IS HEALTHY.

from rupturing. Sometimes the walls of these cysts become cartilaginous, and occasionally are found ossified or converted into bone. Upon the inner surface of this second coat there is a large number of blood-vessels, presenting a rectangular appearance, which are the carriers of the enormous quantity of blood secreted by the epithelium lining the sac. (*Fig. 74.*)

2. *Compound Cysts*.—In this form there may be a number of cysts developed within the parent sac. (*Fig. 75.*) These forms of cysts are capable of great distension, and are usually found in ovarian dropsies. The smaller or sec-

FIG 75.



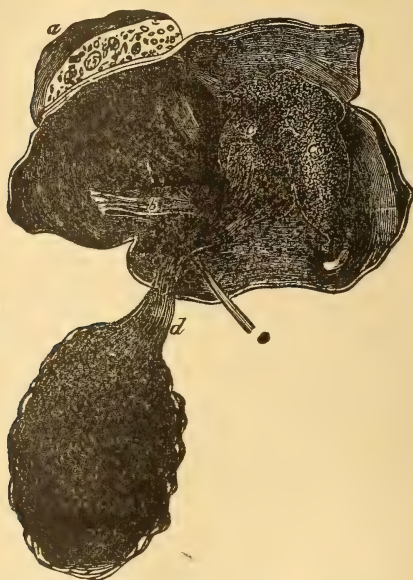
THE RIGHT OVARY DISTENDED INTO ONE LARGE CYST, IN WHICH ARE OBSERVED NUMEROUS SMALL CYSTS OF A SECONDARY ORDER—TO THE RIGHT OF THE FIGURE IS THE UTERUS ATTACHED BY A SMALL PELLICLE. (*Ad. Nat.*)

ondary cysts are always attached to the superior or parent cyst, and are covered by the same membrane that covers the principal sac. The growth of these secondary cysts is very irregular.

Some enlarge rapidly, the walls becoming thin and rupturing, pour their contents into the parent cyst.

Fluid Contents of Cysts.—The thinnest fluid is generally obtained from the single cyst. The contents of the compound cyst are usually much more dense, of the consistency of the white of an egg, honey, or thin glue. Sometimes it is so dense that it is drawn off in long strings through the canals. Occasionally it is the color of coffee-grounds, at other times that of blood and pus mixed together.

FIG. 76.



OVARIAN CYST CONTAINING HAIR, FATTY MATTER, SEBACEOUS GLANDS AND HAIR
REPRESENTATION OF A HAIR HIGHLY MAGNIFIED.

Quantity of Fluid.—The quantity of fluid that has been taken from different persons is enormous. *Imhoff* gives a case where the right ovary contained forty-two pounds of fluid. *Daret*, a case of fifty pints. *Comper*, one where eighty pounds of serum were drawn off, and another is mentioned by *Muller* where there were one hundred and forty pounds in the two ovaries of a woman. The right ovary is twice as

often affected as the left. Seldom both at one time. The number of tappings which they will bear is astonishing. *Pagenstecher* removed in thirty-eight tappings eleven hundred and thirty-two pounds. Dr. *Mead* tapped a patient sixty-seven times in five years and a half, and drew nineteen hundred and twenty pints. *Ford* punctured an ovary forty-nine times, and removed twenty seven hundred and eighty-six pints. *Heidrich*, in eight years, punctured a woman two hundred and ninety-nine times, and removed nine thousand eight hundred and sixty-seven pounds. In another case, in eighty operations he drew six thousand six hundred and thirty-one pints, equal to thirteen hogsheads of fluid.

3. *Hydatids in Ovarian Cysts*.—This is a very rare form, few cases being on record. An interesting preparation is in the Pathological Museum of King's College, England. It consists of an aggregation of cysts, many of them filled with hydatids. They average in size a pigeon's egg, and possess the appearance of Acephalocysts (monsters without heads and hands.)

4. *Dermoid Cysts*.—These consist of fatty matter, hair, teeth, bones, etc. They seldom grow to large size, and are not of frequent occurrence. *Figure 76* illustrates a case where there is long tangled hair, mixed with hard sebaceous matter.

Symptoms.—In the commencement of the disease, there is a dull, heavy pain or soreness in the ovarian region; often the menses are suppressed, with a slight enlargement in the iliac region. As the cyst enlarges, the intestines are displaced, and the stomach, liver, spleen, and diaphragm are forced into the thorax. Sometimes there is hectic fever, more or less pain, vomiting and general emaciation. Occasionally the sac ruptures, and the contents are discharged into the abdominal cavity, Fallopian tubes or uterus. When emptied into the abdominal cavity, the fluid may be absorbed,

or it may cause severe peritoneal inflammation and death.

Cause.—Falls are a frequent cause; blows, inflammation, suppression of the menses, etc.

Treatment.—Had I space, I might present a large number of cases that have been successfully treated after having attained an enormous size and been frequently tapped.

The usual mode of affording relief after the cysts have attained a size to interfere with the functions of the viscera and impaired the general health, is by tapping. This is but temporary. The only successful treatment is the removal of the tumor, by some skillful physician.

The disease may be arrested if taken early. The following is the most rational means that can be adopted: A pad should be applied to the tumor, secured by a bandage that will keep up a general pressure. Iodine should be applied by painting the surface of the skin, or by moistening the pad with it twice a day.

The following may be given by the stomach:

℞ Compound syrup of *stillingia* ℥viii.

Dose—One teaspoonful three or four times a day.

The bowels should be opened once a day with cream of tartar and phodophylin.

In one case I treated, I found the inhalation of diluted oxygen gas prevented the tumor from enlarging for over two months, and greatly improved the patient's health. She stopped the treatment for the purpose of visiting the country and during her absence it greatly enlarged. It was not afterward employed. It is certainly worthy of a more extensive trial.

CHAPTER XXV.

STRUCTURE OF THE SKIN.

THE skin consists of several distinct layers, and serves several important purposes in the animal economy.

1st. It affords a complete covering and protection to the sensitive nerves.

2nd. It affords a large exhalant surface for the elimination of effete fluids from the blood.

3rd. It possesses inhalant apparatus by which fluids may be absorbed.

4th. It prevents the too rapid evaporation of the fluids of the body.

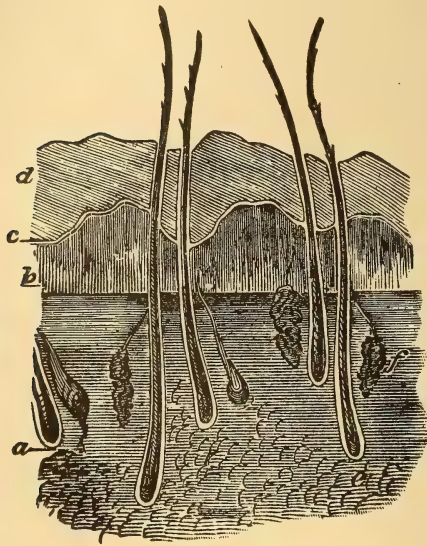
The skin is usually divided into three distinct layers.

Cutis vera, or sensitive skin.—This forms the undermost layer, and consists of white and yellow fibrous tissue closely interwoven together. (Fig. 78.) It is usually divided into two parts. The lower, or internal, is called the *chorion*, (a), and the upper or outer the *papillary body*, (b). The papillary surface possesses a distinct function, namely, that of touch. The sense of touch is dependent upon the sensitive nerves, which are arranged in loops in the papillary bodies of the skin. The papillæ are largely supplied with blood-vessels and lymphatics. They are more numerous when the skin is most sensitive, and contract on the approach of cold, which produces a roughness termed *cutis anserina, or goose-flesh*.

Basement Membrane, or the Rete Mucosum. (Fig. 78, c.) This is the second layer of skin. It is the matrix of the epidermis or outer layer of the skin. It consists of a thin layer of homogeneous fluid derived from the blood.

Epidermis, or Cuticle.—This is the outer layer of the skin, and invests the entire surface of the body. It consists of cells arranged in several layers. It is insensible and unvascular, there being no nerves or blood-vessels found in it. It receives its nourishment from the basement membrane lying beneath. As new cells form, the others are

FIG. 78.



STRUCTURE OF SKIN.

a, CHORION; *b*, PAPILLARY PORTION OF CUTIS VERA; *c*, BASEMENT MEMBRANE OR RETE MUCOSUM; *d*, EPIDERMIS; *e*, HAIR BULB; *f*, SEBACEOUS GLAND TERMINATING IN A HAIR FOLLICLE.

pressed up and become dry and are thrown off in the form of scurf. Hence there is more or less scurf continually thrown off from the skin, which, if not eliminated, would clog up the pores of which the skin is supplied, and thus prevent the evaporation of effete matter from the blood. From this fact, we perceive the necessity of keeping the

surface of the skin perfectly clean if we wish to maintain health and a healthy appearance of the body's surface.

The white and soap-like crust observed covering the skin of new-born children, consists of epidermic scales, with mucus and oil globules. This is called *vernix caseosa*.

In blistering, scalds and burns, the outer surface of the skin or epidermis is destroyed and stripped off, which leaves the sensitive surface, or *cutis vera*, exposed to the oxygen of the air, causing pain.

The main object in treating burns should be to form an artificial cuticle to protect this delicate surface.

One of the best remedies that can be applied, is by saturating raw cotton with one part of chloroform or ether, and two parts of sweet oil. The oil prevents the absorption of oxygen, while the chloroform or ether removes the pain. Flour mixed with water, in the form of paste, and applied, will also answer a good purpose. The white of eggs covered with oil-silk, will likewise afford an artificial cuticle. Carbonic acid applied to a burned surface, will immediately remove the pain.

The use of the epidermis is to protect the sensitive surface; to prevent a too rapid dissipation of caloric; and to prevent a too rapid evaporation of the fluids of the body.

The color of the different races is depending upon a pigment that is deposited in the second layer of the skin, which becomes mingled with the epidermic cells.

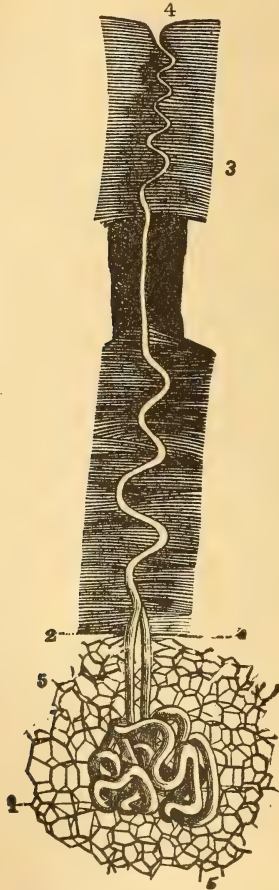
In the negro they are of a dark black color, while in the white races they are almost entirely wanting, excepting in freckles, when they are observed of a lightish hue.

By blistering the skin of a negro it becomes nearly the color of the white person, but the pigment soon forms again.

Sudoriferous Glands.—These are usually called the sweat glands. They consist of tubes with open mouths

upon the surface of the epidermis, and extend through the three layers of skin to the sub-cutaneous tissue below. (Fig. 79.)

FIG. 79.



SUDORIFEROUS GLAND FROM THE PALM OF THE HAND—MAGNIFIED.

1, 1, contorted tubes, composing the gland, which are united by two excretory ducts; 2, 2, which afterward unite into one spiral canal which passes through the epidermis at 3, and opens on its surface at 4; the gland is imbedded in fat-vesicles, which are seen at 5, 5.

The number of square inches in a man of ordinary stature is estimated at 2,500. Accordingly, the total number of pores must be 7,000,000, and the length of tubing 1,750,000 inches, or 145,833 feet, or 48,611 yards, or 28 miles.

The fluid passing off from these glands is usually in the form of vapor, and is called *insensible perspiration*. When it is more profuse it appears in drops, and is then called *sensible perspiration*. It usually contains lactic acid, which gives the perspiration, when it is profuse, a sour smell. There are about twelve parts only in 1,000 of solid matter—the balance consists of water. The amount passing off in the shape of insensible perspiration, has been estimated

FIG. 80.



SEBACEOUS FOLLICLES FROM THE NOSE, WITH HAIR

at eleven grains per minute. Perspiration is wonderfully modified by the condition of the atmosphere. When the weather is dry and hot it is quite profuse; when it is warm and moist the perspiration is less, and when the weather is still colder the moisture of the skin is diminished in proportion to the degree of the thermal changes.

Sebaceous Glands.—These are distinct from the sudo-

rific glands--the former being more abundant where the latter are the least abundant, and *vice versa*. They are absent on the soles of the feet and palms of hands, and numerous on the face, scalp, etc. They are little crypts or sacs, imbedded in the *cutis vera*, or true skin. (*Fig. 78, f*, and *Fig. 80.*) Sometimes there are several of these clustered around a duct, into which they open. Sometimes the ducts of these glands perform a double function, forming a sheath for the hair and outlet for their glands.

These glands (the sebaceous) secrete an oleaginous substance, which serves to keep the skin smooth and pliable, and to prevent it from becoming dry and cracked by the action of heat, etc. The secretion is found more abundant in those who inhabit warm climates, and with those whose occupations subject them to high temperatures.

CHAPTER XXVI.

FUNCTION OF THE SKIN, AND THE BEST MEANS FOR ITS PRESERVATION.

THE function of the skin has already been explained, while the importance of keeping it clean and in a healthy condition, as an Element of Female Beauty, has likewise been demonstrated. It will accordingly, only be necessary in this chapter to present some of the best cosmetics used in fashionable and refined society for preserving and beautifying the skin.

As I have already intimated, a bright, clear complexion is only to be acquired by three things—*temperance, exercise, and cleanliness*. If these are not maintained, all the cosmetics in the world will be of no avail whatever. Were a young lady as fair as Hebe or charming as Venus, she will speedily mar the most exquisite and voluptuous loveliness by too high living and late hours. As to *diet*—strong coffee, hot cakes and butter; rich peppered soups; fish; sweetmeats, etc., have destroyed many a constitution, driven the roses from the cheeks and suffused the countenance with a saffron or bilious hue. There are a great many disorders induced by ignorance, as connected with fashion and habit. Besides these, the frequent changes of the weather, or the sudden transition from cold to heat, and heat to cold, have a sad effect upon the skin, roughening its texture, injuring its hue and deforming it with unseemly eruptions. The head and face, especially, need protection from the atmosphere. Nor should any lady ever go out into the hot sun without her veil, or without her having her head properly covered. Going out in the autumnal evening without a sufficient covering to the head, particularly, is exceedingly

detrimental to the beauty of complexion. The custom of drying the perspiration from the face by powdering it, or cooling it when hot from exposure to sun or dancing, by washing with cold water, is most destructive to the softness and brilliancy of the complexion. The exercise of a little judgment would teach every lady that when she is over-heated, she ought to permit herself to cool gradually, and by all means to avoid going into the air, or allowing a draught through an open window or door to blow upon her when thus heated. Excessive heat is as bad as excessive cold for the complexion. In the dingy face of the desert-wandering gypsy, may be seen the effects of exposure to alternate heats and colds. Let all young women, especially, attend to the few rules we have already laid down, and each will then be able to retain her health and beauty to the latest period of life.

GENERAL RECIPES.

NO. 1. WASH FOR THE SKIN AND COMPLEXION.

To remedy the rigidity of the muscles of the face, and to cure any roughness induced by daily exposure, the following *wash* may be applied, with almost certain relief, as we are assured by Madame LOLA MONTES, the celebrated *Countess of Landsfelt*.

Mix two pints of white brandy with one part of rose-water, and wash the face with it, night and morning.

The brandy keeps up a gentle action of the skin, which is so essential to its healthy appearance; also thoroughly cleanses its surface, while the rose-water counteracts the drying nature of the brandy, and leaves the skin in a natural, soft and flexible state.

NO. 2. COMPLEXION PASTE.—The following is the receipt for the paste, by the use of which *Madame Vestris*



EXERCISE 16—TO REDUCE LARGE HIPS OR INCREASE SMALL ONES.



EXERCISE 19—TO DEVELOP THE LEGS.

is said to have preserved her beauty till very late in life. It is applied to the face on retiring for the night.

The white of four eggs boiled in rose-water, half an ounce of alum, half an ounce of oil of sweet almonds, beat the whole together till it assumes the consistence of a paste.

No. 3. A "REMARKABLE WASH." said to have been used by the Beauties of the Court of Charles II., is made of a simple tincture of benzoin precipitated in water. We quote:

"This delightful wash seems to have the effect of calling the purple stream of the blood to the external fibres of the face, and gives the cheeks a beautiful rosy color. If left on the face to dry, it will render the skin clear and brilliant. It is an excellent remedy for spots, freckles, pimples and eruptions, if they have not been of long standing."

No. 4. TO REMOVE PIMPLES.—There are many kinds of pimples, some of which partake almost of the nature of ulcers, which require medical treatment, but the small red pimple, which is most common, may be removed by applying the following twice a day:

Sulphur water	I ounce.
Acetated liquor of ammonia	1/2 "
Solution of potassa	1/2 "
White-wine vinegar	2 "
Distilled water	2 "

These pimples are sometimes cured by frequent washing in warm water and prolonged friction with a coarse towel. The cause of these pimples is obstruction of the skin and imperfect circulation.

No. 5. TO REMOVE "FLESHWORMS"—Sometimes little black specks appear about the base of the nose, or on the forehead, or in the hollow of the chin, which are called "fleshworms;" are occasioned by coagulated secretion that obstructs the pores of the skin. They may be squeezed out by gentle pressing. They are permanently removed by

washing with warm water, and severe friction with a towel, and then applying a little of the following preparation:

Liquor of potassa	1 ounce
Cologne	2 "
White brandy	4 "

The warm water and friction alone are sometimes sufficient.

No. 6. *QUEEN BESS'S COMPLEXION WASH.*—The following receipt has been handed down from the time of *Queen Elizabeth*. Its daily use preserved the beauty of her complexion to extreme old age.

Into a phial place one drachm of Benzoin gum in powder, the same quantity of grated nutmeg, and about six drops of the essence of orange blossoms; then fill up the bottle with a wineglassful of the finest Sherry. Shake the ingredients every day for a week, then mix the whole with a pint of orange-flower water; strain through fine muslin, and the "*Lait Virginal*," is finished. The face is to be bathed with it night and morning.

No. 7. *AN EXCELLENT COSMETIC.*—Take of blanched bitter almonds, two ounces; blanched sweet almonds, one ounce; beat to a paste, add distilled water, one quart: mix well, strain, put into a bottle, add boric acid in powder, twenty grains, dissolve in two table-spoonsful of spirits of wine, and shake well. Used to impart a delightful softness to the skin, and also as a wash for obstinate, eruptive diseases. Wet the skin with it, either by means of the corner of a napkin, or the fingers dipped into it, and then gently wipe off with a dry cloth.

No. 8. *LAVENDER WATER* of a very excellent quality, may be prepared thus:—Rectified spirit, two quarts; rose water, one pint; English oil of lavender one ounce and a half; oil of cloves, half a drachm. Mix and distil the whole together so long as it comes over bright.

No. 9. ELDER-FLOWER WATER is frequently found serviceable in producing that enviable softness of the skin which the ladies so much admire; but the best way to begin is to attack the enemy in his strongest fortress, the stomach. Whilst trying cosmetics, it is an excellent plan to purify the blood with some gentle asperient; and the following simple preparation, which may be taken all through the spring, summer and autumn, will be found highly advantageous: Put two ounces of Epsom salts, half an ounce of cream of tartar, and the half of a rind of lemon, into a quart of boiling water. When cold, decant it into a bottle, cork it close, and take a wineglassful every morning before breakfast. It will remove giddiness and headaches, besides operating as an admirable purifier.—*Elixir of Beauty*.

No. 10. FRECKLES.—Freckles are situated in the middle and outer membrane of the skin; and before any other application, it will be advisable to soften the surface by the use of some mild balsam or paste. The following is an excellent preparation: Two ounces of fine honey, one ounce of purified wax, half an ounce of silver litharge, half an ounce of myrrh. Mix them well together over a slow fire, perfuming with oil of roses, eau-de-cologne, or any other agreeable perfume. Another: One ounce of bitter almonds, one ounce of barley-flour, mix a sufficient quantity of honey to make the whole into a smooth paste; with which the face, more particularly where the freckles are visible, is to be anointed at night, and the paste washed off in the morning.

No. 11. FRECKLE PASTE.—The following is a good application, the surface of the skin having been previously softened by a little mild balsam or emollient paste:

One ounce of bitter almonds; one ounce of barley flour. Mix with a sufficient quantity of honey to make the whole into a smooth paste, with which the face, particularly where

the freckles appear, is to be anointed at night, and the paste washed off in the morning.

No. 12. FOR A WASH FOR FRECKLES, TAN, ETC.—Take two ounces of lemon juice, half a drachm of powdered borax, and one drachm of sugar. Mix them together and let them stand a few days in a glass bottle till the liquor is fit for use; rub it on the hands and face two or three times a day.

No. 13. FRECKLE COMPOUND.—The so-called “Uction de Maintenon,” after the celebrated Madame de Maintenon, mistress and wife of Louis XIV., is made as follows:

Venice soap	1 ounce.
Lemon juice	½ ”
Oil of bitter almonds	¼ ”
Deliquated oil of tartar	¼ ”
Oil of rhodium	3 drops.

No. 14. FRECKLE WASH.—One drachm of muriatic acid; half pint of rain water; half teaspoonful of spirit lavender. Mix them well together, and apply two or three times a day to the freckles, with a camel’s-hair brush.

No. 15. LEMON CREAM FOR SUNBURNS, ETC.—Put two spoonful of fresh cream into half a pint of new milk; squeeze into it the juice of a lemon, and half a glass of brandy, a little alum and loaf sugar; boil the whole, skim it well, and when cool it is fit for use.

No. 16. PREVENTIVE WASH FOR SUNBURN.—Two drachms of borax; one drachm of Roman alum; one drachm of camphor; half ounce of sugar, one pound of ox-gall. Mix and stir well together, and repeat the stirring three or four times a day, until the mixture becomes transparent. Then strain it through filtering paper, and it is fit for use.

CHAPTER XXVII.

THE CARE OF CHILDREN.

THE proper management of children is the most important subject that can be brought to the consideration of a parent; and yet, it is one that has been greatly neglected. Mothers undertake the management of children without previous instruction, thinking it can be learned by instinct or by affection. The consequence is they find themselves too often in a condition of uncertainty and trouble, and act not unfrequently directly in opposition to the best physical and mental welfare of their charges. Undoubtedly the proper management of a child begins even before birth. Prenatal influences and education are of vast importance; yet how greatly neglected, and persistently misunderstood! Those who would have healthy children, must be themselves healthy. They must obey the laws of nature and morality. They must not expect good fruit from poor soil. Physical strength, good organization, agreeable temper, and nobleness of mind beget their like; drunkenness, debility, debasement of body and mind yield similar characteristics in the progeny. Children who inherit the former start from the highest vantage ground; children with the latter start in the race of life handicapped and at a great disadvantage. From the earliest moment after conception the mother should pay even more than usual care to her personal health. Her clothing should be loose and comfortable, and adapted to the gradual development of her abdomen and breasts. Tight lacing is injurious to both child and mother, and should be carefully avoided. The judicious use of tepid baths once or twice a week, with a daily sponge bath of luke-warm water, followed by friction with a coarse towel, will be conducive to her welfare. The mother should also take

short, gentle, and frequent walks during the whole period of pregnancy. In fact she should spend much of the time in the open air, with mild exercise and occupation, and in this way her general health will be kept in proper tone, the bowels open, and the growing foetus will be nourished and strengthened, and the foundation laid for an easier labor and a good getting up. This abundance of air and occupation explains the rapid labors and speedy recoveries of poor women. Such need to work, but in their very toil they are favoring nature's operations, and their compensation is in an easy confinement, unattended with much inconvenience or anxiety. Indolence during pregnancy is enervating to mother and foetus. A pregnant woman is not an invalid. She is not compelled to lie down most of the time. To be with child it a natural physiological process, the fulfilling of the Divine mandate, and the highest crowning act of womanhood.

The pregnant woman should exercise some care of her dietary. Meat should be eaten but once a day; rich soups and highly seasoned foods avoided, and all alcoholic and other stimulants strictly shunned. She should eat rather less during her pregnancy than at ordinary times; for while it is true she has two to provide for, yet she has less drain upon her system, from the fact that she no longer is unwell, and the foetus, up to the third month, is not much larger than an egg. An overloaded stomach also may favor the distressing nausea and morning sickness of early pregnancy. During the latter months of pregnancy the diet should be fuller, for if it is too light it is likely to make the mother a poor nurse for her child, both in the quantity and quality of her milk.

A pregnant woman should retire early to rest—at least by ten o'clock—and be up in good time in the morning for her ablution, morning stroll in seasonable weather, and an early breakfast. In short she should use every means in her power to make and keep herself healthy, not only for

the sake of herself and her husband, but also for the sake of her forming child and for the welfare of the human race. It should be borne in mind that the period of intra-uterine life is one full of danger to the health of the fœtus; of the family to act in an emergency as a nurse, or even as a physician. In such a case, just as soon after the birth as the breathing process is well established in the babe, tie the naval cord about one and a half inches from the infant's stomach with a stout white string. Do not use cotton thread, even if doubled. It is well to tie the cord again one inch beyond the first tie, and cut with a sharp pair of scissors between these two ties, using care not to let a sudden movement of the child plunge the scissors into its flesh. Roll the child in a suitable covering and lay it aside until the care of the mother is over.

When the mother has been made comfortable, attention should again be directed to the child, and, first, it should have a bath. It is not uncommon to hear cold water advised for the first bath of a new-born infant, under the impression of its strengthening the child. This is not sound advice. If water is used warm (not hot), it will not enervate, nor be likely to cause colds and inflammation, which attend the use of cold water. After rubbing well with good grease, as olive oil, cold cream, or cosmoline, the parts of the body containing the peculiar white paste-like substance found upon the new-born infant, wash well with a piece of flannel, warm water, and Castile soap, finishing with a large sponge, by which the water can be made to stream over the child, acting like a miniature shower bath. Under ordinary circumstances there is no need of adding brandy or liquor not only does ill health in the mother react upon the defenseless little creature, but it may be, her thoughts, her mental and moral states, her passions, are reproduced in the child. It is of the utmost importance then that she be surrounded with comfort, cheer, and happiness; that no unkindness be shown her by her husband or family; that

she have all advantages of mental ease and comfort to implant in the miniature human being qualities good and noble. How readily mothers believe in birth-marks, and yet how ignorant or negligent are they of prenatal impressions affecting health and morals.

It is to be remembered that during a prolonged period mother and child form together but one living system, and whatever injures the mother's constitution also involves that of her progeny.

It must be borne in mind that the health of the father, at the time of the impregnation, also influences very much the future child's welfare.

CARE OF THE NEW-BORN INFANT.

While no one is herein advised to usurp the place of a physician or a skilled nurse in the lying-in room, yet, under peculiar circumstances, it may fall to the lot of some member of any kind to the water. After the bath dry the skin well with soft towels, rather absorbing the moisture than using any severe rubbing; then dust all the parts likely to chafe with some simple dusting powder, starch, lycopodium, or violet powder. While bathing the child the nurse should wear a thick, soft flannel apron, made long and full.

If the infant should breathe feebly, or exhibit other signs of great feebleness, it should not be washed at once, but allowed to remain quiet, warm, and undisturbed until the vital actions have assumed a fair degree of activity.

The Care of the Navel.—There is nothing better for dressing the navel than a piece of soft rag *unsinged*, which should be greased and neatly wrapped around the cord, as you would wrap a cut finger, kept in place with a few rounds of thread. The navel string thus covered should lay upward on the belly, and be supported in this position by means of a bandage passed around the child's body—a simple strip of flannel, about four inches wide, being the most suitable. Care should be used not to draw this band-

age too tight around the abdomen. It should be loose enough to admit the introduction of a finger between it and the belly. The proper use of the bandage prevents rupture at the navel, while if applied too firmly it compresses the abdominal cavity, so that in the forcible descent of the diaphragm in the act of crying, coughing and straining, it presses the internal organs downward and forces the bowels through the natural openings in the walls of the abdomen, thus producing rupture in the groin. The bandage should be worn for four to six months before it is laid aside.

The navel string usually separates in a week's time, but it may be delayed for twice this length of time. This will make no material difference, and the rule is to allow it to drop off of its own accord. If the navel is a little sore after the separation of the cord, or if excoriation occurs before it is fully separated, cleanliness in connection with a bland, soothing salve will be all that is required.

CLOTHING FOR THE INFANT.

To be more explicit about the bandage, which has been already mentioned before, it may be added that it is usually cut the selvage way of the material, as are cuffs and wristbands. Some persons prefer the horizontal strip as being more elastic, while we have known a prominent physician who forbade the use of any but bias bands, especially for boy babies. The band should be cut in one piece, and never hemmed, since any seam might hurt the tender body it is to girdle. Sometimes the band is bound with silk flannel binding and sometimes buttonhole-stitched on the edges with coarsely twisted silk floss, but generally the edges are left raw. Knitted bands are excellent. For these cast on one hundred and thirty stitches, and knit with four needles in Saxon yarn or zephyr worsted, in the well-known rib-stitch, knit three and turn two. Knit the band from six to seven inches deep. This band is elastic enough to yield to every breath of the infant and yet sufficiently strong to afford sup-

port to the tender back. Except in midsummer, a knitted shirt of Saxon yarn should also be worn, and even then, when the band is removed, the shirt should take its place.

The narrow coat or pinning blanket for wear at night, and during the day also, for the first month of the infant's life, is a straight piece of flannel, three-quarters of a yard in length and a yard and a half wide, gathered into a straight band of muslin four inches broad and twenty inches long. The belt must be pinned, as it will be too large for a young infant; below it the skirt, which is to be left open like an apron its whole length, must be furnished with buttons and buttonholes close enough together to prevent the child from getting its feet through. Flannel, with part of cotton to three of wool, corded together, is a better one than all-wool for this, as it shrinks less.

The rubber diaper has many friends and many foes, and there is much to be said on both sides. If the nurse is careful it will be found a comfort, since it keeps the clothing dry, and can do no harm except where it is made an excuse for not changing the child as frequently as is necessary. When it is used there should be two or three, and they should be frequently aired. Wash them always in cold water, and wipe on a towel; then hang them in a cool place to dry. When the baby's skin is very delicate their use may cause chafing, unless great care is taken; this is the only valid objection against them.

The Quality and Quantity of Clothes.—The quality and quantity of the child's clothing must be regulated by the means of its parents. Every mother will probably have the best she can afford, but, whether rich or plain, it should be carefully made; all seams felled, and no rough edges left to chafe the tender skin. Much trimming is unnecessary, and she who can afford to spend only a limited amount on her baby's wardrobe had best put most of that into the material of which they are made. Coarse flannels, heavily embroidered; cheap cambric loaded with tawdry cotton laces

or coarse Hamburg edges, are not to be compared to finer materials simply made; the flannels overcast with zephyr wool or linen floss; the cambric or nainsook slips finished with a plain hem, or a ruffle of the same, and with a tiny edge at the neck and sleeves. Six of every garment—three night flannels and three for day—constitute the minimum layette. Twelve diapers may answer, by careful management, but unless they can be washed every day at least eighteen will be required. A flannel cape or a woolen shawl is necessary to throw around the child in passing from one room to another during the first weeks of its existence. Summer and winter, until it is two years old, it should wear a flannel shirt long enough to cover the bowels. The knitted shirt already described is sufficient for the first six months and for warm weather. In the winter it should be replaced by high-necked and long-sleeved flannels. Some children require bibs by the dozen, others scarcely need them at all. Fleece-lined pique and nainsook wadded and quilted are the best materials to make them of. Infants' cloaks are usually of white merino trimmed with white silk, satin, fringe, swan's down, or embroidery, as the parents may fancy or can afford. In shape they should be a long circular or a sacque, each having a long cape. The first head covering is a lace or shirred muslin cap, lined in winter with white merino or fine flannel for warmth.

A nightgown of muslin or white percale—cambric is too thin and linen too cool, except for summer—and a flannel wrapper, to be worn on cold nights, with its napkin, complete the child's night dress. Cotton diaper is best for use in winter, linen in summer, and some mothers prefer cantoon flannel for night wear in winter. The same material—cantoon flannel—should always be used for children's night gowns in cold weather after the child is six months of age. The day petticoats should be two breadths wide, the flannel cut straight, the muslin one slightly gored. Many mothers do not put their babies into long clothes at all; mak-

ing the skirts eighteen inches long at first, a length which comes down well over the feet, but little more, and letting the infant wear woolen socks to keep its feet warm—a sensible fashion which it is to be hoped may some day be generally adopted. The superstition that it is unlucky to put an infant's long clothes on over its head is a fortunate one for the babies, since it is a worrying process to have so much pass over the little face, not to speak of the danger to the tender spine, since it is a difficult matter to give it proper support while holding the baby up for the operation. On the other hand, in putting them on feet foremost the infant lies comfortably on the lap, while its feet and legs are lifted and drawn as far into the skirts as is necessary.

Before beginning to dress the baby have everything ready, so that the operation may be quickly and comfortably performed.

The clothing of an infant should be warm, light, and loose. Its clothing generally is too long and cumbersome. All that is required is for the feet to be well covered. The parts of the child's body that should be kept warm are the chest, bowels, and the feet. None of the clothing should be tight enough to make undue pressure upon the blood-vessels, impeding the circulation and hindering the proper development of the body. The lungs and heart must not be kept free from having free play, and pressure over the stomach impedes digestion.

Pins should be used sparingly about the clothing. Even the diapers could be fastened with loops and tapes. When pins are used they should always be of the safety kind.

During the early months of the child's life, warmth is peculiarly needful for the infantile system, and where there is any tendency to weakness and imperfect development of animal temperature, flannel clothing is particularly necessary to favor the accumulation of warmth in the infant's body. Benefit may also result from its gentle stimulating action upon the cutaneous surface. In hot weather muslin

may be used instead of flannel, but even then a careful mother or nurse will change at once the clothing to suit the varying stages of the weather. In summer infants are not infrequently kept too warm by too thick and warm coverlids while sleeping.

With its usual clothing the infant is often laid upon a bed of feathers, and covered with a thick spread. This causes a copious perspiration, making the baby liable to catarrhal and bowel complaints, if exposed immediately afterward to a current of fresh and cool air. It is important for the welfare of the child that it should not be permitted to sleep in the same flannel or underclothing as worn during the day. The baby's head should be kept cool. Caps for this reason are objectionable. If caps are used it is needful to use care in leaving them off, to guard against cold. When they are to be discontinued, use a thinner and a thinner one until they are left off altogether.

When the child is sent out for an airing, which may be done in two weeks after birth in summer, and in a month's time in winter if the weather is good, and in midday; be sure that it is well wrapped. A knitted worsted spencer, buttoned behind, for wear under the cloak, and a shawl over all if the weather is cool, will protect the little one from harm.

The proper time for "shortening" the clothes is about the end of three months in summer, or six months in winter. This shortening should be only of the extra length, being still long enough to extend below the feet for nearly a year, to protect the lower parts of the body against changes in temperature. By the end of a year the feet should be entirely free, so as to allow free motion of the legs.

While the dress is long, in cold weather, fine woollen stockings, wide enough to be easily put on and to avoid every degree of compression, should be worn; in summer light and soft flannel socks will answer. As soon as the shortening is made, shoes are proper. The shoes should be

made of light and pliable materials, and large enough to prevent all constraint on the feet. Some authors object to putting shoes on infants claiming they cramp the feet, restrain their free movements, and retard the child's learning to walk; but if the shoes be large enough and of good, pliable material, these objections will be obviated. Dr. Dewees says: "Shoes afford protection against the cold, and security against accident when the child is placed upon the floor especially on carpeted floors, where pins, needles, and other sharp substances are often concealed.

The child should be kept dry as possible. Wet diapers or stockings, when permitted to remain on the child for some time, give rise to bowel and febrile complaints. They tend to cover excoriations and painful irritation of the skin about the groin and buttocks. Examine frequently the underclothing of a child, and if any part be found wet, immediately replace it by a dry and clean one.

INFANT BATHING.

Every one will agree that an infant should be regularly bathed from head to foot once a day. The water should be tepid—not hot—and barely warm. After the child is three weeks old it may be put into the water, and supported with one hand while it is washed with the other. It is surprising how soon it will learn to enjoy its bath, to splash and play in the water. Never allow it to remain too long in its tub—from ten to twenty minutes is the limit—the latter time being for a healthy child in warm weather. Wet its head before putting it into the bath. This is to guard against congestion. Use white Castile soap, and either a very soft sponge or an equally soft flannel or linen cloth. Wipe quickly, and dry with a soft towel, holding the child meanwhile upon a blanket in your lap. See that every little crease is wiped out and powdered with corn starch. Burnt flour should be used in case of chafing. Be careful to guard against draughts, and bathe the child near an open fire, if

possible—if not, the bath should be given in a perfectly warm room. Have the clothing hanging at the fire, well warmed and ready to put on at once. The petticoats should be put one in the other, and the dress over them, so that all three may be slipped on at once. Every little waist should be furnished with buttons or buttonholes, and with drawing strings at top and bottom for drawing to the proper size.

An infant's mouth should be cleaned several times a day with a soft rag dipped in clear water. This is especially important in summer and during dentition.

Amount of sleep required each day by children:

At 4 months	20 hours of sleep is required.
At 6 months	18 hours of sleep is required.
At 1 year	15 hours of sleep is required.
At 2 years	13 hours of sleep is required.
At 4 years	12 hours of sleep is required.
At 7 years	11 hours of sleep is required.
At 9 years	10½ hours of sleep is required.
At 14 years	10 hours of sleep is required.

INFANT FEEDING.

Whenever possible, breast milk should be the infant's food. Young infants should be able to obtain about a quart of milk a day from this source; at three months the demand is for three pints; at six months for nearly two quarts. Early in its life the babe should be fed once in two hours, and gradually the interval should be extended until the child is nursed about six times in the twenty-four hours. If the mother finds her milk supply scanty or too rapidly failing, she must use such means as tend to promote the secretion of milk. All powerful emotions and excitements must be avoided. Gentle friction, electricity, moderate coition, and a proper diet favor the lacteal flow. The diet should be generous, avoiding rich and made dishes, using plenty of milk, eggs, meats, fowl, game, fish, and a very moderate

amount of some malt liquor. Oysters, whiting soup, conger-eel soup, and crabs are reputed milk promoters. Pea soup, lentil soup, and turnips, fennel, and parsnips are also recommended. Cocoa, chocolate, and cod-liver oil are useful adjuncts to the diet of a nursing woman. A number of medicines are now used for the purpose of stimulating this function of milk secretion, but their application belongs to the domain of therapeutics, and should be used only by the direction of a physician. The best test of the quality of the mother's milk is whether the child thrives or does not thrive. As a rule, no artificial food whatever should be permitted when the breast milk is good; at any rate, not until the sixth or seventh month.

COMPARATIVE VALUE OF BREAST MILK AND ARTIFICIAL FEEDING.

Without a doubt, breast milk is of incomparably greater value than any artificial food, both as regards the chance of life and the proper development of the child. It is impossible to lay too much emphasis on this point, and those mothers who, from reasons of indolence, fashion, and what not, refuse to perform the sacred duty of nursing their children, must, in most instances, be considered responsible for the weakness, disease, and even death, which their willful neglect may entail. The mother who does not nurse her infant, does not make as good a "getting up." "A mother who does not suckle is more liable to peritonitis, inflammation of the uterus, abscess in the breast, and cancer of the breast and womb." Women, after confinement, often suffer from backache, aching in the thighs, inability to stand long, or to walk much. They have bearing down pains, feeling of heaviness; they tire easily, and feel themselves to be quite invalids. The cause is often an over large uterus; one that has never properly contracted after confinement. This condition, if neglected, leads to falling of the womb, inflammation and ulceration of this organ, whites, and the various

disorders usually called uterine complaints. Now, it is certain that suckling has a very beneficial influence in causing tonic contraction of the womb, and thus preventing the unpleasant and painful train of symptoms just mentioned.

ARTIFICIAL FEEDING.

There are times when a mother cannot and should not nurse her child; a wet nurse should then be the first thought. A child that has been nursed for a short period, either by the mother or by a wet nurse, can be very much more easily brought up by hand than one that is obliged to be hand-fed from birth. When artificial feeding is the only course left to pursue, then the great question is upon what food to place the child. This depends upon the age, state of health, residence in country or city, and upon the circumstances of the family. Milk should form the basis of all preparations of food. For infants it should resemble as nearly as possible the mother's milk. The difference in the milk of various animals is shown by the following table:

Difference in milk of various animals. (Payne.)

Nitrogenous matter and

Women. Cow. Goat. Sheep. Ass. Mare.

Insoluble Salts	3.55	4.55	4.50	8.00	1.70	1.62
Butter	3.34	3.70	4.10	6.50	1.40	0.20
Lactin and soluble salts	3.77	5.35	5.80	4.50	6.40	8.75
Water	89.54	86.40	85.60	82.00	90.50	89.33

It will be seen by this table that the milk of the cow most approximates to that of woman, but it is rather more highly charged with each kind of solid constituent.

VARIOUS DILUTIONS OF MILK FOR VARIOUS AGES.

Mother's milk for new-born babes is so peculiar as to have obtained a special name, *colostrum*. It gradually loses those peculiarities. Colostrum, or milk prepared for the first two weeks of a child's life, must contain much butter. From two quarts of milk, which has stood four or five hours,

skim off carefully half a pint, or the last tenth of milk just stripped from a cow. For example, if a cow gives five quarts, the last pint may be used. The milk must be largely diluted with water, according to the following schedule. Milk is to be made more nutritious as the child advances in age, regard being had, not to mere age, however, but to the condition of the child—the schedule, being arranged to suit vigorous children, will not suit feeble ones, who must be kept back on the scale.

Schedule for the dilution of cow's milk.

Age of child.		Milk Gills.	water Gills	Whole quantity Gills.
2	to 10 days	1 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{2}$
10	to 20 days	1 $\frac{3}{4}$	4 $\frac{1}{4}$	6
20	to 30 days	2 $\frac{1}{2}$	6	8 $\frac{1}{2}$
1	to 1 $\frac{1}{2}$ months	3	6 $\frac{3}{4}$	9 $\frac{3}{4}$
1	to 2 months	3 $\frac{1}{2}$	7	10 $\frac{1}{2}$
2	to 2 $\frac{1}{2}$ months	4	7 $\frac{1}{2}$	11 $\frac{1}{2}$
2 $\frac{1}{2}$	to 3 months	4 $\frac{1}{2}$	7 $\frac{1}{2}$	12
3	to 3 $\frac{1}{2}$ months	5	7 $\frac{1}{2}$	12 $\frac{1}{2}$
3 $\frac{1}{2}$	to 4 months	5 $\frac{1}{2}$	7 $\frac{1}{2}$	13
4	to 4 $\frac{1}{2}$ months	6	7 $\frac{1}{2}$	13 $\frac{1}{2}$
4 $\frac{1}{2}$	to 5 months	6 $\frac{1}{2}$	7 $\frac{1}{2}$	14
5	to 6 months	7	7	14
6	to 7 months	7	7	14
7	to 8 months	8	6	14
8	to 9 months	8 $\frac{1}{4}$	6	14 $\frac{1}{4}$
9	to 10 months	8 $\frac{1}{2}$	6	14 $\frac{1}{2}$
10	to 11 months	8 $\frac{1}{4}$	6 $\frac{1}{4}$	14 $\frac{1}{2}$
11	to 12 months	9	5 $\frac{1}{2}$	14 $\frac{1}{2}$
12	to 15 months	9 $\frac{1}{4}$	5 $\frac{1}{4}$	14 $\frac{1}{2}$
15	to 18 months	9 $\frac{1}{2}$	5	14 $\frac{1}{2}$
18	months	10	5	15

If the milk be too strong, indigestion will follow, and the child will lose instead of gaining strength. When par-

ticles of casein, or curd, pass through its bowels unaltered, a milder quality or lower grade should be substituted. A feeble child of six months may require the food suited to a vigorous child of six months. For constipation, increase the richness of the milk—put in more cream. In cold weather, or if milk is kept on ice, it may stand an hour or two longer before the upper third is removed; or the upper fourth may be taken, or set five quarts instead of three to get one quart.

The water used in diluting milk should not be hard; nor should it be boiled. Add it to the milk, and heat it by putting the bottle in warm water.

Sweetening.—Use loaf sugar enough to make it as sweet as undiluted new milk, a teaspoonful to a quart. If too sweet, it will cloy the appetite, and not enough food will be taken.

Temperature.—The milk should be heated to 100° Fahrenheit; test it once, and try it on the cheek, which should regulate it subsequently.

Although it has been strenuously urged that the milk for an infant's diet should all come from one cow, the fact is this, it does not make so good a diet for children as the milk from several cows.

Dr. Meig's formula for artificial feeding with milk is as follows: Order five or six packages of milk sugar, containing seventeen and three-quarters drachms each; the contents of one of these to be dissolved in a pint of water, and each time the child is to be fed let there be mixed together, and then warmed, three tablespoonfuls of the sugar solution, two of lime water, two of cream, and one of milk. This makes about a gill, and as much of it as the child does not take should be thrown out, and a fresh mixture made for the next feeding. The solution of sugar should be kept in a cool place and at once thrown away if it sours, as occurs if kept more than a day or two in warm weather. The dry sugar keeps indefinitely, and is easily dissolved in warm

water. A pint bottle should be kept for the purpose of containing the solution, to serve also as a measure of the quantity of water to be used with each package dissolved, and also to save further measuring. The milk to be used should be good ordinary cow's milk, and not the very rich milk of Jersey or other high-bred stock, and the cream in the same way should be such as is usually sold in the cities, and not too rich, containing about sixteen or seventeen per cent. of fat. The quantity of this food taken by a new-born infant should be two or three fluid ounces every two hours, and if it thrive it will soon take as much as a gill every two hours.

It must be remembered that young infants get a true dyspepsia from starchy foods. Starch is not assimilable by animals until it is converted into glucose, which is accomplished through the action of the salivary and pancreatic secretions, both of which are largely deficient in the infant. This is the great bar to success in artificial feeding, and is the great obstacle to be overcome.

The eruption of teeth is a plain indication of the need of farinaceous and other more substantial foods, but for the first three years of life the diet of a child should be essentially a milk diet.

COMPARATIVE VALUE OF CONDENSED MILK.

Dr. Edson says: "In canned condensed milk we have an article that fully meets the ordinary requirements of bottle-fed children.

"I am fully aware that writers and *quasi* authorities have very generally condemned this kind of milk, chiefly on account of the large amount of sugar it contains. Most of those who have admitted the value of condensed milk for infants have drawn the line between that sold in bulk and that put up in tins.

"As regards canned condensed milk, I am not aware of

any instances where it has been faithfully and intelligently used and proved a failure. I do not know of any series of cases in which any constant illness or departure from health has resulted. I have yet to learn of any disease produced by its proper use, or that it fails to sustain and promote the healthy and hardy growth of the infant. I think it remains to be demonstrated that pure sugar, in the quantity used in preserving condensed milk, is in any way unwholesome for the young child.

"In the use of condensed milk, intelligent oversight and pains-taking care are required to guard against gross errors in feeding. The tendency is to use the food too strong. A good formula to begin with is as follows:

Condensed milk, one part.

Water (temp. 100°), 12-15 parts.

Lime water, 1-2 parts.

Salt, a trace.

The strength and quantity should be gradually increased until the third month, when the child may take two teaspoonsful of milk, twenty of water, and two to four of lime water.

"The great number and variety of surprising mistakes that well-meaning mothers and nurses are capable of making—to say nothing of the lapses of those who are more or less indifferent respecting those under their charge—can scarcely be credited, except by those who have some experience in this matter. I have known mothers, despite positive directions as to quantity, to give at the rate of a twelve ounce tin of milk in less than two days. It is not rare to find the entire day's supply made up in the morning, in spite of positive directions to prepare the food fresh at each feeding. Indigestion and its various manifestations are the inevitable result of such unwisdom in preparing any food for children."

RULES FOR MANAGING THE INFANT DURING THE SUMMER MONTHS.

The great increase of sickness and death among young children during the summer months is due largely to ignorance on the part of mothers and nurses. Attention to the following rules would save many a life:

1. Bathe the child once a day in tepid water. If it is feeble, sponge it all over twice a day with tepid water, or with tepid water and vinegar. The health of a child depends much upon its cleanliness.

2. Avoid all tight bandaging. Make the clothing light and cool, and so loose that the child may have free play for its limbs. At night undress it, sponge it, and put on a slip. In the morning remove the slip, bathe the child, and put it in clean clothes. If this cannot be afforded, thoroughly air the day clothing by hanging them up during the night. Use clean diapers, and change them often. Never dry a soiled one in the nursery or in the sitting-room, and never use one a second time without first washing it.

3. The child should sleep by itself in a cot or cradle. It should be put to bed at regular hours, and be early taught to go to sleep without being nursed in the arms. Without the advice of a physician never give it any *spirits, cordials, carminatives, soothing syrups, or sleeping drops. Thousands of children die every year from the use of these poisons.* If the child frets and does not sleep, it is either hungry or else ill. If ill, it needs a physician. Never quiet it by candy or cake; they are the common causes of diarrhoea and of other troubles.

4. Give the child plenty of fresh air. In the cool of the morning and evening send it out to the shady side of broad streets, to the public squares, or to the park. Make frequent excursions on the river. Whenever it seems to suffer from the heat, let it drink freely of ice water. Keep it out of the room in which washing or cooking is going on. It is

excessive heat that destroys the lives of young infants.

5. Keep your house sweet and clean, cool and well aired. In very hot weather let the windows be open day and night. Do your cooking in the yard, in a shed, in the garret, or in an upper room. Whitewash the walls every spring, and see that the cellar is clear of all rubbish. Let no slops collect to poison the air. Correct all foul smells by pouring into the sinks and privies carbolic acid, or quicklime, or the chloride of lime, or a strong solution of copperas. These articles can be got from the nearest druggist, who will give the needful directions for their use. Make every effort yourself, and urge your neighbors to keep clean the gutters of your street, or of your court.

6. *Breast milk is the only proper food for infants.* If the supply is ample and the child thrives on it, no other kind of food should be given while the hot weather lasts. If the mother has not enough, she must not wean the child, but give it, beside the breast, goat's or cow's milk, as prepared under Rule 8. Nurse the child once in two or three hours during the day, and as seldom as possible during the night. Always remove the child from the breast as soon as it has fallen asleep. Avoid giving the breast when you are over-fatigued or over-heated.

7. If, unfortunately, the child must be brought up by hand, it should be fed on a milk diet alone—that is, warm milk out of a nursing-bottle, as directed under Rule 8. Goat's milk is the best, and next to it cow's milk. If the child thrives on this diet, *no other kind of food whatever should be given while the hot weather lasts.* At all seasons of the year, but especially in summer, there is no safe substitute for milk, if the child has not cut its front teeth. *Sago, arrowroot, potatoes, corn flour, crackers, bread, every patented food, and every article of diet containing starch, cannot, and must not be depended on as a food for very young infants.* Creeping or walking children must not be allowed to pick up unwholesome food.



HOW TO ARRANGE THE HAIR.

8. If the milk is known to be pure, it should have one-third part of hot water added to it, until the child is three months old; after this age the proportion of water should be gradually lessened. Each half pint of this food should be sweetened, either with a dessertspoonful of sugar of milk, or with a teaspoonful of crushed sugar. When the heat of the weather is great, the milk may be given quite cold. Be sure that the milk is unskimmed; have it as fresh as possible, and brought very early in the morning. Before using the pans into which it is to be poured, always scald them with boiling suds. In very hot weather, boil the milk as soon as it comes, and at once put away the vessels holding it in the coolest place in the house—upon ice, if it can be afforded, or down a well. Milk carelessly allowed to stand in a warm room soon spoils, and becomes unfit for food.

9. If the milk should disagree, a tablespoonful of lime water may be added to each bottleful. Whenever pure milk cannot be got, try the condensed milk, which often answers admirably. It is sold by all leading druggists and grocers, and may be prepared by adding to ten tablespoonfuls of boiling water, without sugar, one tablespoonful or more of the milk, according to the age of the child. Should this disagree, a teaspoonful of arrowroot, sago, or cornstarch may be cautiously added to a pint of the milk, as prepared under Rule 8. If milk in any shape cannot be digested, try, for a few days, pure cream, diluted with three-fifths or four-fifths of water—returning to the milk as soon as possible.

10. The nursing-bottle must be kept perfectly clean; otherwise the milk will turn sour, and the child will be made ill. After each meal it should be emptied, rinsed out, taken apart, and the nipple and bottle placed in clean water, or in water to which a little soda has been added. It is a good plan to have two nursing-bottles, and to use them by turns. The best kind is the plain bottle with a rubber nipple and no tube.

body to be carried in an erect position, for fear of an evil effect upon the soft and pliant bony system. The nurse should see that the child is changed from arm to arm in carrying, for the same reason that no undue pressure or force may be produced on one side of the infant's body. It is not best to encourage a sitting posture until the third month. For even six months the head of the infant should, in carrying, be supported by the nurse's hand.

All rapid concussive movements are bad for the child. Running or jumping with an infant in the arms, descending rapidly a flight of stairs, jolting upon the knees, tossing rudely in the arms, are all wrong and fraught with danger. Gentle and cautious tossing in the arms affords an agreeable exercise of the body, and may be salutary by the moderate agitation which it causes in the internal organs.

Quit a controversy has been carried on as to the propriety of using cradles for infants. While rude and constant rocking may do harm, especially with infants predisposed to diseases of the brain, gentle and cautious rocking can do no harm. It is the happy mean to be obtained in the application of hygienic laws.

Riding in the carriage may be open to a similar objection as the cradle, if left to the careless conduct of a servant. The carriage should not be pushed along with great rapidity, without any attention to the roughness of the way. The carriage should be sufficiently long to permit the infant to lie at full length; the sides high enough to prevent its falling out. Low wheels should be used to lessen the liability of oversetting.

After the infant has acquired sufficient strength to support itself in a sitting posture, it will be well to place it on the carpet a few times a day, with toys within easy reach. This will give free use of the limbs, and teach it to crawl. A child should be allowed to crawl freely, making this the easy and natural preliminary muscular effort to walking. The too common practice of forcing the walking process by

supporting the child on its legs and leading it forward, is objectionable, causing not infrequently bent limbs, curved spine, and round shoulders. Teach the child, then, to crawl before it walks; and in good weather there will be no objection to the child's being carried out and placed on a grass plot, where it can range about in various directions. Let the rule be to teach the infant gradually and cautiously the art of walking. In this way not only will a firm step and well-formed limbs be acquired, but the dangers of dislocations, painful injuries, as well as the mishaps mentioned above, be obviated. Nurse-maids, too indolent to carry the infant, when unobserved, will place a child just learning to walk on the ground and drag it along by one arm in the most careless manner. This should be most earnestly forbidden. A child should not be raised from the ground by both arms and swung about in the air. Fractures and other serious accidents have occurred in this way. When children have learned to walk, it is the best exercise they can take. In this way they secure a fine physique, and obtain the indispensable fresh air. "At no period of life are the effects of confinement in stagnant and impure air more obvious and lastingly detrimental to the animal economy than during the feeble and susceptible age of childhood. How deeply pernicious a foul and confined air is in its influence on the human system, is most strikingly illustrated in the pale, feeble, and sickly aspect of those unfortunate children who are early placed in the manufacturing establishments, where they are confined nearly the whole day in crowded and ill-ventilated apartments. Children brought up in the crowded and filthy parts of large cities, seldom exhibit a perfectly healthy and vigorous appearance."

As intimated before, this exposure of infants to pure air should begin in a very few weeks after birth; an hour or two a day at first, but daily whenever the weather permits. They soon evince a strong desire for the open air. When yet carried by the nurse, they point to the door; when crawl-

ing, they try to approach it; when walking, they attempt to escape from the house to the air without. This, however, must not be construed into advice to carry out the child in unfavorable weather or for a long time, with an idea of hardening it. Catarrhal inflammations are easily produced in children.

When old enough to play and romp, the dress should not be so fine as to require an order of good care. Nothing affords more real enjoyment to children, and, at the same time tends more decidedly to give them a sound and active tone of mind and body, than a liberal indulgence in exercise and their innocent sports out of doors. Too often children are sent out to show, not to breathe in air and to exercise lungs and limbs. In cities children should often be taken to squares and parks, to obtain pure air and to promote the salutary tendencies these little excursions seem to have. In earlier years of infancy and childhood no difference should be observed in the freedom of exercise and amusement in the open air between boys and girls, Mothers fear even for such young girls that the sun will make their skin dark and harsh. Girls, like boys, ought to be freely and frequently exposed to the open air and weather, which will extend its salutary influence throughout the whole subsequent period of life. Children should be cautioned, however, to avoid sitting or lying down on the cool and damp ground, or in a draught of air, after violent running. They should not drink cold water too freely or frequently while in a heated condition.

WHAT TO OBSERVE IN A CHILD.

The most important points to be attended to in making up an opinion of a child's condition, are the countenance, noting its expression, coloration, wrinkles, etc.; the sleep; the cry; the state of emaciation or fatness; the condition of the skin, as to eruptions, color, temperature, degrees of dryness, swelling, etc.; the pulse; the respiration; the signs

furnished by the mouth and throat; the power of sucking; and, finally, the state of the abdomen.

TABLE OF PULSE RATE OF CHILDREN.

Young infants.....	100 to 102.
First year	115.
Second year	118.
Second to sixth year.....	Sleeping, 76; waking, 92.
Sixth to ninth year.....	Sleeping, 73; waking, 90.
Ninth to twelfth year.....	Sleeping, 72; waking, 80.
Twelfth to fifteenth year.....	Sleeping, 70; waking, 72.

In girls the rate is about five beats higher.

TABLE OF TEMPERATURE OF CHILDREN.

1. The daily range of temperature is greater in the healthy child than that recorded in healthy adults, amounting to 1, 2, or 3 degrees.

2. There is invariably a fall of temperature in the evening, amounting to 1° to 3° F.

3. This fall may take place before sleep begins.

4. The greatest fall is usually between 7 and 9 P. M.

5. The minimum temperature is usually observed at or before 2 A. M.

6. Between 2 and 4 A. M. the temperature usually begins to rise, such rise being independent of food being taken.

7. The fluctuations between breakfast and tea time are usually trifling in amount.

8. There seems to be no very definite relationship between the frequency of the pulse and respirations, and the amount of the temperature; the former being subject to many disturbing influences.

RESPIRATION IN CHILDREN.

The respiration and the pulse of a child must be investigated while the child is still and quiet. In the young infant it should be done during sleep. This is the only way certain

and reliable results can be obtained. The rate of respiration differs greatly at different ages. The average frequency of the breathing in new-born children, and during the first week of life, is thirty-nine times per minute. It may rise, however, upon very slight disturbances, to fifty, sixty, or eighty. In perfectly healthy infants during sleep the respiration may fall to twenty-five per minute.

Per minute

Between 2 mos. and 2 yrs. average number respirations. .	35
Between 2 yrs. and 6 yrs. average number respirations. .	23
Between 6 yrs. and 12 yrs. average number respirations. .	22
Between 12 yrs. and 15 yrs. average number respirations. .	20

It will be seen that after the age of two years the rate of the respiration is nearly the same throughout the remainder of the period of childhood; the same average will answer for all practical purposes all through that period.

A peculiar feature of the breathing of young infants, is that it is largely abdominal, the walls of the chest being almost motionless. During sleep the breathing of a young child is soft and regular, and perfectly noiseless; when awake it is quite different from that of an adult, being short irregular, uneven, and now and then a pause, followed by hurried movements of respiration. After two years the breathing becomes more like that of adults—even and regular.

In all inflammatory conditions of the lungs the breathing is quickened. In severe pneumonia and capillary bronchitis it becomes very rapid.

There is a kind of breathing frequently seen in sick children which is indicative of great oppression and also of great danger. It is called the *expiratory* respiration. The little patient makes at first a violent and labored expiration, bringing into a kind of convulsive action all the expiratory muscles of respiration; instantly after the expiration follows a rapid and full inspiration; then occurs a momentary pause,

and again the respiratory act begins with the labored expiratory act.

EVACUATIONS OF A CHILD.

The healthy motion varies from a light orange yellow to a greenish yellow, and in number, from two to four times daily.

Smell should never be offensive. Slimy, mucous-like, jelly motions indicate worms. Offensive, acid, pale-green motions indicate a disordered stomach. Dark-green evacuations indicate acid secretions and more serious stomach or bowel disorder.

Fetid, dark-brown stools are present in chronic diarrhœa. Putty-like, pasty passages are due to acidity curdling the milk or to torpid liver.

GENERAL SIGNS OF HEALTH IN THE INFANT.

A child healthy from birth ought to have attained a certain size and development at a certain age. It should not at the third month look like a new-born child, or at the twelfth month like one of six months. This applies also to the degree of fatness. Rotundity is the beauty of youth. Dr. Meigs says of a healthful child: "Its tissues are firm and solid, its surface of a cool and pleasant temperature, its coloration of a clear and exquisitely white, firmly tempered with a faint rosy tint in a warm atmosphere, or slightly marbled with light bluish spot in a colder air. Few marks more certainly indicate a healthful temper of the constitution than the clear and exquisitely tinted pink color of the palmar and plantar surface of the hands and feet of a young child. Nothing, indeed, can be more beautiful or perfect in shape or contour than the figure of a fine, hearty young child; nothing more pleasing to the eye than its delicate but vivid coloring; and nothing more expressive of the fullness of health and vitality than its whole appearance." If, instead of these marks, we find emaciation, soft tissues, a

dingy tint to the complexion, pallid or bluish feet and hands, listless movements, we can rest assured something is interfering with the machinery of life.

The movements and gestures of a child give a clue to its condition. Healthy children are, when awake, almost always in motion. Even young infants are, when awake, constantly moving their limbs. If the child is laboring under disease of any kind, the disposition to movement is gone. The free and spontaneous movements of health are replaced by the sudden, impatient, and causeless tossing on bed or lap. Extreme restlessness, constant tossing, or the desire for change, first to the bed, then to the arms, is a very bad sign. Among the important gestures we would call especial attention to the frequent carrying of the hand to the head, or to the ear, as indicative of headache or earache. Children have earache oftener than usually supposed. The constant thrusting of the fingers into the mouth indicates pain of dentition. Convulsions are generally heralded by twitchings and irregular movements of the muscles.



EXERCISE 29—THE TWIRL AT WAIST LEVEL.



EXERCISE 30—TO STRAIGHTEN THE ARMS.

CHAPTER XXVIII.

HYGIENE AND CARE OF THE AGED.

IN olden times the alchemists claimed to have discovered the elixir of life. They said that old age might be retarded and life greatly prolonged by means of an elixir having the power of preventing or suspending physical decay.

The possibility of prolonging life has in all ages been noticed by great thinkers.

The latest scientific knowledge in regard to this subject may be stated as follows: The principal characteristics of old age, as demonstrated by anatomical research, are a deposition of fibrinous, gelatinous, and earthy material in the system. Every organ of the body, during old age, is especially prone to ossific deposits. The earthy deposits have been found to consist primarily of phosphates and carbonates of lime combined with other calcareous salts.

Man begins in a gelatinous and ends in an osseous or bony condition. From the cradle to the grave a gradual process of ossification is undoubtedly present; but after passing middle age the ossific tendency becomes more markedly developed until it finally ushers in senile decrepitude. These earthy deposits during old age materially interfere with the due performance of function by the organs; hence, we find imperfect circulation in the aged; the heart gradually becomes ossified; the large blood-vessels blocked up with calcareous matter, and nutrition hindered.

“If repair was always equal to waste, life would only terminate by accident.” It is the opinion of eminent scientists that the majority of all who pass sixty-five years suffer more or less from these ossific deposits. Therefore, bearing these facts in mind, it is plain that the real change which produces old age is, in truth, nothing more or less

than a slow but steady accumulation of calcareous matter throughout the system; and it is owing to these deposits that the structure of every organ is altered, elasticity thus giving way to senile rigidity. Blockage of various organs is thus commenced, and sooner or later a vital part becomes involved, and death of necessity follows. The idea that old age was brought about simply, or at all, by a decline of the vital principle, has long since been discarded by scientists, and the true cause found to be that of gradual disintegration of the tissues because of the inadequate supply of blood.

The feebleness of old age, therefore, being due to nothing more nor less than ossific deposits, it is well for a moment to look for the causes and influences leading to the condition described.

THE CAUSES OF OLD AGE AND THEIR AVOIDANCE.

The two principal causes of old age are, first, fibrinous and gelatinous substances; and second, calcareous deposits. According to recent researches, the origin of the first, the fibrinous and gelatinous, may undoubtedly be traced to the destruction of atmospheric oxygen.

Although unquestionably fibrin nourishes the organs of our body, yet it becomes at times, as we reach the cool and shady walks in the evening of life, accumulated in redundant quantity, blockading the streams of life as do the chilling winds of winter the mountain rivulets.

The calcareous deposits are proved to be caused by gradual deposition from the water which forms so large a part (70 per cent) of the human system, and to be introduced by means of food.

As a matter of fact, everything we eat does contain these calcareous matters to a greater or less degree. The cereals are found most rich in them; so bread itself, the so-called staff of life, except in great moderation, most assuredly

favors the deposition of these salts in the system. The more nitrogenous our food, the greater its percentage of calcareous matter; thus a diet composed principally of fruit, from its lack of nitrogen, is best adapted for preventing or suspending ossification.

Moderation in eating, then, must ever be of great value as an agent for retarding the advent of senile decay. Large eaters more rapidly bring on ossific deposits by taking in more than is utilized or excreted, naturally resulting in blockading the vessels and destroying their normal functions. According to the best authorities, the following seem to be the best articles of food as containing the least of earthy salts: Fruit, fish, poultry, flesh of young mutton or beef; because, as before stated, they are much less nitrogenous. Fluids, as part of the diet, is of special import. All well and spring water contains considerable of the earthy salts, and should, therefore, be avoided, and cistern water used in its stead, because water is the most universal solvent known. Therefore, if when taken into the system clear of foreign matter, it is to that extent the better prepared to dissolve and take up those earthy salts and convey them out of the system. The addition of fifteen or twenty drops of dilute phosphoric acid to the glass of water, and drunk three times a day, will add to the solubility of these earthy salts.

RULES FOR THE CARE OF THE AGED

1. The aged should not endeavor to perform the feats of agility, strength, endurance, and "of digestion," which were once their pride, especially during the extreme heat of summer.
2. The aged should avoid torpor of the bowels and constipation. Straining at stool may cause apoplexy.
3. Do not give up all mental and bodily work.
4. In the chill of any evening, or of early autumn, the

aged need fire. Many an otherwise long life is cut short from neglect of this rule, by an attack of some form of lung inflammation.

5. Life can be prolonged, without a doubt, by a proper change of climate and of scene. The flickering flame of life can be protected from going out by a careful hand.

6. All warnings of weakness, or on-coming sickness, or decay, should at once be noticed by the aged, and due precaution and proper treatment instituted at once.

CHAPTER XXIX.

SUGGESTIONS FOR GRACE AND BEAUTY.

THE CARE OF THE EYES, HAIR, EAR, SKIN, TEETH, MOUTH,
HANDS, AND FEET.

To take proper care of the eyes is to do all we can to avoid such diseases as are avoidable.

TEST OF EYESIGHT.

Boys often discover their near-sightedness by finding that their playmates can read signs, and see clocks and faces at much greater distances than they can. If any, who are not near-sighted, wish to compare their powers of vision, they can find convenient tests in the heavens at night.

Almost everybody knows the constellations of the Great Dipper and Pleiades. Both of these furnish tests of the range of vision. In the latter, a good eye can readily distinguish six stars; one of higher power can detect eleven; one of extraordinary power can pick out thirteen or fourteen. A telescope brings from fifty to a hundred within easy range.

The middle star in the handle of the Great Dipper has a companion star, which a good eye can make out. There is also a third and fainter star, which demands superior vision to detect. Very strong eyes can pick out some of the moons of Jupiter, particularly when two of them happen to come into conjunction.

While the winter sky is bright and favorable, any reader can make the test. Near-sightedness is a growing defect among young people, and may be corrected in part by looking at distant objects in the heavens or on the ocean.

WEAK SIGHT.

Fatigue of the eyes during or after the use of them is the first symptom of weak sight. This is more noticeable at first after reading, writing, or sewing in the evening; soon the same fatigue is noticed after similar occupation in day time. In time this fatigue comes on immediately after attempting to read or sew, and, if work is continued, pain and confusion of vision follows; letters run together, lines are blurred and indistinct. Weak sight is simply a disorder of the muscular apparatus of the eyes.

There are four striking symptoms by which we may judge that the eyes are being injured;

1. Redness of the eyelids and balls.
2. Pain in the eyes.
3. Indistinct or imperfect vision.
4. Frontal or other headaches.

In health the muscles act in perfect harmony, but if these muscles are overworked, fatigued, or sensitive, they do not act harmoniously, and weak sight is the result. Other beside local causes may produce this effect. Any general ill health, during convalescence from long fever, or any cause depressing the tone of the constitution, may indirectly affect the eyes, for the eye muscles share in the general weakness of the body, and any misuse of the organs of sight will result in harm. There is a good rule, "Never use the eyes unless they are abundantly supplied with good blood." During sickness, or when in a state of exhaustion, the eyes are not supplied with the best quality of blood, and great harm can come from too free use of them during such times.

WEAK SIGHT DUE TO IMPERFECT LIGHT.

Another good rule is, *never use an imperfect light*. What is an imperfect light?

1. Deficient amount of light, as in the early morning or twilight, or an artificial light far distant, or a very small

artificial light, or light far from a window which is too small for the room and for a dark day. When the light is such as to render it difficult to see the work or print before us, a proper regard for the preservation of vision will compel the immediate stopping of the work. Of course, there are different kinds of work requiring different amounts of light, but the general rule just stated will hold good.

2. Light may be imperfect from its unsteadiness. It is this quality that renders the electric light harmful to vision. Gas light often exhibits a degree of flickering very trying to the eyes.

3. The light may be steady, but the car or carriage in which we are seated may move. The attempt to read in the cars is a fruitful source of injury to the eyes. Some of the worst cases of muscular weakness of the eyes have been derived from this cause.

4. The practice of reading while in a reclining position upon a lounge or in a bed causes the light to enter the eye at such an angle as to require an undue amount of effort in order to see distinctly for a long time. Such a position should always be avoided.

When possible, the light should fall upon the printed page or upon our work from the left side of the body, and from behind the shoulders. In this way the movements of the right hand least obstruct the light and the rays are reflected with greatest directness from the page to the eye.

RULES FOR THE PRESERVATION OF GOOD SIGHT.

The way to obtain and maintain the best eyesight may be summed up in these plain propositions:

1. Act as if the eyesight were of more importance than any other thing on earth.

2. Have every child's eyes carefully examined by an expert before it is given specific tasks to perform calling for the full exercise of healthy eyes. If the eyes are found

defective, then grade the tasks according to the nature of the defect.

3. Never use the eyes when such use causes pain in these organs or in the head.

4. Never use the eyes when imperfectly supplied with blood, as before breakfast, when exhausted after a severe illness, etc.

5. Never use the eyes for close work in an imperfect light.

6. Avoid the excessive use of alcohol and tobacco.

7. Heed the warnings given by redness of the eyelids, and of the whites of the eyes; by pain in or about the eye; by the continuance of indistinct vision for any considerable time.

8. Regard the eyes as a part of a very complex system of apparatuses, the best health of all being absolutely needful for the best health of each.

9. Remember that we do not see with the eye, but with the brain. Hence after the brain is exhausted it is impossible to really see. Hence the absurdity, as well as perniciousness, of any endeavor to see after the brain is exhausted. Especially is this true of young and growing brains. It is well to remember that the normal brain continues to grow until about the age of forty.

THE USE OF SPECTACLES AND EYE GLASSES.

Weak sight is very often due to defective form of the eyeball itself, it being too flat, too full, or of irregular form.

The large majority of eyes are more or less imperfect in form, and this explains the prevalence of sight weakness. In cases of defective eyeballs, beside following the advice given above, the imperfect shape must be neutralized by the scientific adaptation of spectacles. It is quite wrong to depend upon your own judgment in this matter, or to procure your glasses from a traveling pedlar of spectacles.

For elderly people, spectacles are usually preferred to eye

glasses, but for occasional use, eye glasses, attached to the clothing by a suitable cord or small chain, are always at hand, and may be quickly adjusted. For long use, spectacles are more comfortable.

Blue or smoked glasses are useful in weak sight, when there is much dread of light; but unless really necessary, the eye may become so habituated to a subdued light by the constant use of colored glasses as to be intolerant of ordinary light. Their use should be confined chiefly to wear in bright sunlight on the snow, sand, or water. For reading, colored glasses should not be too dark in tint, as too much exertion is required to see clearly through them.

CONTAGIOUS EYE DISEASES.

It should be borne in mind, that diseases of the lids or eyes attended with a pus discharge are contagious. Those suffering with such a disease should be kept apart from others, and great attention should be paid to cleanliness. Towels and washing material should not be used in common.

DISEASES OF THE EYES OF NEW-BORN INFANTS.

Young babies are quite subject to severe inflammation of the eyes, usually making its appearance in a few days after birth. There is great swelling of the eyelids, and a copious purulent discharge, which is highly contagious. This affection is very dangerous to the sight, and therefore the very best medical aid should be secured. It will not be amiss, however, to caution the great care that should be used as regards cleanliness, and the avoidance of any of the matter coming in contact with healthy eyes.

COMMON EYE ACCIDENTS.

Those who work where splinters of metal or stone are liable to strike the eye should wear spectacles at their work,

Spectacles of ordinary glass are a good protection against cinders in traveling. *Eye stones* are nothing but smoothly-worn pebbles. *It is not best to use them.* It is not common-sense treatment to cure an irritable eye, suffering from a foreign body, by placing another foreign body therein.

A cinder, or other foreign body, may often be displaced by quietly and steadily looking downward at your feet, letting the tears that form wash out the irritating substance. If the foreign body sticks on the ball, it sometimes can be readily wiped off with a piece of paper twisted to a lamp-lighter shape, or the free end of a common match. If it does not come off easily, professional aid must be secured, as great harm may be done the beautiful, transparent front of the eye by the use of sharp instruments in unskilled hands.

If quick-lime or mortar has fallen into the eyes, the best plan is to drop in some olive oil at once. The eye then may be washed out with warm water, to wash away all the particles of lime. This can best be done with a small syringe. If acid has gotten into the eye, use milk and water at once, and in the same manner.

Children are fond of exploding caps with a stone or hammer. This is a very dangerous sport. A piece of exploded percussion cap entering the eye is usually fatal to the injured organ

CARE OF THE EAR.

The general advice as to the care of the ears is quite similar to that given under the subject of care of the eyes.

1. Act as if hearing were of more importance than any other thing on earth.
2. Refrain from use of the ear when it causes pain, choosing quiet places and deadening sound by use of cotton plugs.
3. Avoid all such injuries to the ears as result from slapping, pulling, and very loud and sudden noises.

4. Keep out of the external ear all things smaller than the forefinger, or stiffer than a towel or handkerchief.

5. Keep out of the ear all oils, all soaps, all cold water, and everything else recommended by kind but mistaken friends; especially never apply a poultice to the ear for the relief of pain. Dry heat will do all that moist heat can do to relieve, and be free from the danger of absolutely destroying the drum of the ear.

Rules 8 and 9, under the subject of care of the eyes, apply with the same force to the care of the ear. Dr. Van Harlingen remarks upon the hygiene of the ear as follows: "All attempts to clean the deeper portions of the outer passage of the ear by means of ear-spoons and other contrivances, are unnecessary, and sometimes give rise to inflammation. In health, the deeper parts of the ear can be left to take care of themselves. The orifice of the canal is to be cleansed in precisely the same manner as any other depressed portion of the surface of the body—that is, with a wet sponge or cloth. Bathing in salt water may injure the ear in two different ways. The water may gain an entrance into the external canal, and by its irritating properties set up an inflammation. I am disposed, however, to believe that in the great majority of cases the disease is caused in another way. In the manœuvres incident to diving, swimming under water, floating on the back, etc., the nasal passages become filled with salt water. The bather then yields to an almost irresistible desire to blow his nose, in order to get rid of the irritating fluid. The blowing is generally of a vigorous character, and often forces some of the salty fluid up through the nasal passage (Eustachian tube) which leads from the back part of the nose to the drum cavity, where its presence may give rise to even very severe inflammation. If the bather is careless, or not familiar with the surf, his ears may receive injury from the mere impact of the waves. What can be done to avoid these injurious effects of bathing? After the bath abstain from blowing the nose in any but the

gentlest manner until after all the active secretions of mucus have ceased. It is considered advisable to wear cotton in the ears during bathing if the bather has an irritable skin, or has had some affection of the ear canal, or if he knows that his drum-head is perforated; otherwise the protection afforded by the cotton is too slight to compensate for its annoyance.

CARE OF THE SKIN.

Every-day washing should be the rule the year round, but particularly so in summer. Ablution of the person sufficient for cleanliness may easily be made to act also as a proper stimulant by using a rapid sponge bath, followed by quick rubbing for a few moments with a towel of such texture as can be borne without irritation. The skin will not bear the frictions of a lintish towel so well in summer as in winter. Invalids should avoid chilling the body; simple and generally healthful as bathing is, it cannot be trifled with. Many a good man or woman has unwittingly committed suicide with water. Mankind is disposed to abuse and misuse almost every good thing. If the person is very feeble and very sensitive to the application of water, such a one can attend to one part of the body one day and another the next. It is well, however, to give daily attention to the feet. The feet perform a large part of our bodily labor, and the excretion from them is so great that particular care should be taken to keep them clean. Warm sponging, followed by friction, is more suitable for cleansing the skin of dirt, and for the delicate invalid and child. The cold bath in the tub, as the same in the river or sea, needs much more caution as to the condition of the system, the time and circumstances, than the sponge bath needful for cleanliness and health. Only those who daily use the morning sponge bath can imagine the glow, invigoration, and general good feeling that come from it.

The tepid or warm tub bath may, with proper care, be

occasionally indulged in as a luxury, and may be made a means of cure for the ill, or a preventative for one threatened with disease. The vapor bath, the hot bath, and the so-called Russian—in which more extreme changes of temperature and perspiration are gone through—all require much care and skill in their use than the more simple kinds, and without this skill and care much more harm than good may accrue. The air both, or a short exposure to the air and sun, accompanied with a degree of friction, or if the atmosphere be warm, a longer exposure to the sun is salutary; and, like a frequent change of clothing and the exposure of the naked body to the dry heat of a fire for a few moments, is beneficial. Whatever stimulates gently the skin without irritating, chilling, or inducing much perspiration, invigorates it and prepares it to resist disease.

SOAP.

The amount of soap used in the toilet depends upon the delicacy of the skin and the exposure to which it has been subjected. Those who have oily skins, particularly about the face and shoulders, depending upon well-developed and active oil-glands, require much more soap than those having harsh and dry skins lacking in oily secretions.

A good soap should be composed of caustic soda and refined animal fat, or the best olive oil, to which perfume may be added. Too often strong perfumes are added to hide the evil quality of a soap, made, perchance, of rancid fats and various oily refuse. Opaque and mottled soaps are more easily adulterated by the makers than pure white or transparent soaps. Good *white* Castile soap, or a transparent soap, should be, therefore, the kind selected.

COSMETICS.

Cosmetics are substances applied to the skin, hair, teeth, nails, etc., to improve their appearance. None of them are essential to health; some are positively harmful. A num-

ber of cases are on record of poisoning from the use of face powders. Such powders as contain lead are the most dangerous. To remove the shine of the skin in hot weather, a little powder may be allowable, but the simplest, and such as is made at home—as powdered starch or rice flour—only should be used.

FORMULA FOR A TOILET COLOGNE.

Oil of bergamot	4	drachms.
Oil of lemon, oil of orange, lavender, of each.	$1\frac{1}{2}$	drachms.
Oil of cloves, neroli, of each	$\frac{1}{2}$	drachm.
Oil of cinnamon	15	drops.
Deodorized alcohol	3	pints.
Rose water	6	ounces.

CARE OF THE TEETH.

Attention to the teeth should begin early in life, even during the period of first teeth. Decay of the “milk” teeth should be prevented, and filling is just as important as with the permanent set. The temporary teeth must be removed in due time, if they do not fall out themselves, and the permanent ones must be trained to fill their places. The teeth should be cleansed five times a day—morning, bedtime, and after each meal. A soft brush is better than a stiff one, so as not to wound the gums. The best dentifrice is *water*; sometimes a little prepared chalk or white Castile soap may be used. The too frequent use of powders containing cuttlefish bone or charcoal will injure the enamel of the teeth. When the gums are tender and tend to bleed, add a few drops of tincture of myrrh to the water. Avoid all patent powders and washes. It is a good rule to visit the dentist once each season to find out the exact condition of these important organs. Never lose a tooth, if Art can save it. The shape of the jaw and face is altered by the removal of teeth. When, by reason of a collection of tartar on the

teeth, a powder is desired for its removal, the following will be found to be useful and agreeable:

TOOTH POWDER.

Precipitated chalk	12 drachms.
Rose pink	2 drachms.
Carbonate of magnesia	1 drachm.
Oil of rose	5 drops.

Mix all well together.

CARE OF THE MOUTH.

Besides the care of the teeth, the mouth itself should receive some attention. The mucous membrane lining the lips and mouth and covering the tongue, is quite thin, and easily absorbs matters placed in contact with it. It is only reasonable, then, to advise care as to the putting of coins in the mouth, as to promiscuous kissing, and the licking of postage stamps. Even some caution should be exercised as to putting the fingers in the mouth, without washing, after handling books in public libraries, handles of street cars, etc., which are touched by the high and low, cleanly and dirty. This is an argument in favor of the constant use of gloves, and shows that the demands of fashion are often based upon sound philosophy. We trust the day will come when fashion will put a stop to the usual kiss salutation of ladies, and especially the kissing of children by every relative, friend, and acquaintance that happens to come in their company. Sore throats, diphtheria, and even loathsome diseases, are communicated in this way.

Another point in this connection is the use by children of toys which are painted with poisonous dyes, and the eating of colored candy. It is best to select toys of plain wood, and candies uncolored.

CARE OF THE HANDS.

To prevent the cracking and roughness of the hands, so

common in winter, cold water alone should be used, and soap used only sparingly. The hands should not be washed just before going out of doors; but, if they are washed then, rub in a little good grease, as cosmoline, to prevent the action of the air. Skin gloves, as kid, dog-skin, castor, or buckskin, should always be worn in cold weather. Silk or woolen gloves are more likely to give rise to chapping. If the hands have become chapped, anoint at bedtime with tallow, cold cream, or cosmoline; put on an old pair of gloves, and in the morning merely wipe off, do not wash, the hands.

For whitening the Hands.—Take a wine-glassful of cologne water, and another of lemon juice, then scrape two cakes of brown Windsor soap to a powder, and mix well in a mould. When hard, it will be an excellent soap for whitening the hands.

CARE OF THE FEET.

Corns and bunions are usually caused by improperly-fitted shoes. The shoe should be shaped in accordance with the proper outline of the foot, and made of pliable and soft leather. Certainly it is plain that the foot must get into the shoe, and if the shoe differs in shape from the foot, the more pliable foot will adapt itself to the shape of the shoe. Fashion has in the past dictated an arbitrary form of shoe. She has really determined that nature made the foot entirely wrong, and has taken it upon herself to change the shape. Now, it holds true of any organ in the body, if we in any way change its form, not only do we not improve, but we actually disfigure it. The function of a shoe is to protect the foot, not to distort its shape.

IN-GROWING TOE NAIL.

The cure of this condition—from which so many persons suffer—of the much-abused foot is slow but sure. The foot must be often soaked in warm water, until the soreness is so



EXERCISE 31—TO STRENGTHEN THE BACK.



EXERCISE 32—TO DEVELOP GRACEFUL MOVEMENTS.

far abated that it can be handled without much pain; then, with a probe or suitable instrument, pass pledgets of absorbent cotton (plain or medicated with glycerine, or some healing, soothing remedy) as firmly as possible under the most detached point of the nail. The toe should be dressed daily, soaking it with warm water and applying fresh cotton, pressing the same farther and farther under the nail, as it may be necessary. When portions of the nail become free, they may be cut off, and mild caustics, as burnt alum, may be applied to remove proud flesh. Scraping the nail in its centre will be an aid to getting the cotton more successfully in its place.

Do not change the shoes of children first to one side, then the other. This is done to make the shoes wear evenly, or prevent their turning over to one side at the heel. This is a saving of shoe leather at the foot's expense. After one foot has shaped a shoe to itself, a change to the other foot should never be allowed.

It has been recommended that those who are desirous of having their feet natural and healthful should not wear unyielding stockings. There is no doubt that during the growing years stockings can influence the shape of the foot, especially if they are tight, short, and narrow-toed, drawing the toes together, and keeping them there. An English author recommends the wearing of stockings with toes, similar to the fingers on a glove.

CORNS AND BUNIONS.

A common corn is caused by friction or irritation of the skin from tight, loose, or otherwise ill-fitting shoes, hard, stiff leather, large wrinkles over the joints, high heels that pitch the foot forward and keep it constantly bearing against the leather over the toes, and shoes narrow at the toes. In such cases the skin thickens and hardens to protect itself from injury, in just the same way that it does upon the hands or other parts of the body exposed to rough contact.

The great cause of bunions is the wearing of short and narrow-toed shoes, making a constant tendency to enlarge, widen, and project the joint of the great toe.

Ordinary hard corns, when young, may be removed by scraping up the callous skin about the borders and prying out carefully with a penknife. It must be remembered, for the successful treatment of corns, proper foot covering must be worn. The shoes must be soft and of proper fit. Only such means can effect a radical cure. Corn cures and plasters are but a vexation if the laws of hygiene are not obeyed. Treat the foot with as much care as the hair, or face, or teeth, and far less will be heard of corns. The radical cure is easy, but few obtain it. Fashion, ignorant shoemakers, custom, and carelessness, combine to inflict upon our most useful members torture and a degree of uselessness. The important part of treating corns is to relieve the pressure. Persons ill with a long fever, confined to their beds, have found their corns gone on getting from bed.

Quite a successful plan of treatment is as follows: Rub the corn twice a day with volatile liniment, and in the interior cover with a corn plaster. Every morning and evening the foot is to be put for half an hour in warm water, and while there the corn is to be well rubbed with soap. Afterward all the soft, white, pulpy matter is to be scraped off with a blunt knife, stopping the scraping, however, the moment pain is felt. If this treatment is persisted in, the corn will be cured in about two weeks. Another method: Soak the corn as above, shaving off the horny substance, then touch with nitric acid. The aqua-regia, nitro-muriatic acid, is the usual secret remedy of the "corn cures." Some doctors have advised that the corns be shaved down close, after soaking in warm water and soap, and then be covered with a piece of wash-leather or buckskin, on which lead-plaster is spread, a hole being cut in the leather the size of the corn. They may be softened so as to be easily scraped out by rub-

bing glycerine on them. In applying acids, only a very little should be used, and applied with some sharp-pointed instrument. This destroys the papilla and changes the structure of the skin, so that the corn never reappears. It is not necessary to burn the surrounding tissues, but only to cause a very small burn, just on the hardened point of the corn.

A bunion is really an inflammation of a sac at the inside of the ball of the great toe. The treatment is soothing; caustics, as a rule, are not allowable, and the deformity is more or less permanent.

The callosities that come upon the heel can be scraped off after soaking in warm water and soap.

The toe nails should be cut regularly and carefully. Overshoes should always be worn in wet weather. Ladies often go without them in damp weather, relying upon the thickness of the soles of their shoes, and thus expose themselves to risks. A sheet of India-rubber is sometimes placed between the layers of leather in the soles of shoes, or felt or cork soles are placed within the shoe. There is no objection to these, providing they do not supplant the rubber overshoes.

HAIR DYES AND OTHER MEANS FOR ITS BEAUTY AND PRESERVATION.

It should be borne in mind that no artificial means will preserve the richness and strength of the human hair, or prevent its premature decay or falling out without good health, regular habits, frequent ablutions of the body in water, early rising for walking and riding. Though the *natural* hair is always to be preferred, yet every lady may be freely pardoned for using such innocent appliances of art

and science as may tend to heighten the native graces and loveliness of her person, and remedy any abnormal or constitutional defect of whatever kind, particularly such as may affect or have a bearing upon the hair. Hair dyes, pomades, oils, etc., and even *false* hair braids, curls, etc., are all perfectly justifiable, under a suitable discrimination concomitant of propriety, good sense, taste and refinement.

“If a woman have long hair, it is a glory to her,” says the Apostle. Especially in young females, it should be allowed to fall in graceful ringlets, “unconfined and free,” over the snowy shoulders and swan-like necks of our American fair—alike models of grace and loveliness.

That this ornament may be rendered as tasteful as it is capable of being made, it should be kept free from scurf and other impurities.

It is advisable for those ladies who engage in domestic offices to wear a light bonnet or cap, to preserve the hair from dust and keep it glossy and clean.

The following receipts are in common use—some of which are considered harmless, and may therefore be used with propriety.

A CAPITAL POMADE.—Dissolve thoroughly over a slow fire two ounces of white wax and half an ounce of palm oil, with a flask of the best olive oil. Stir it till nearly cold; then add one ounce of castor oil and about threepenny worth of bergamot or any other perfume you please.

TO PROMOTE THE GROWTH OF HAIR.—The following is a good oil to promote the growth of the hair:

℞ Palma-christi oil 3 ounces.
Oil of lavender I drachm.

Apply morning and evening to those parts where the hair is weak and deficient, in consequence of a deficiency of moisture.

BARON DUPUYTREN'S POMADE.—The famous pomade of the celebrated Parisian physician is made as follows:

℞ Boxwood shavings	6 ounces.
Proof spirit	12 ounces.
Spirits of rosemary	2 ounces.
Spirits of nutmeg	½ ounce.

The box-wood shavings should be left to steep in the spirits, at a temperature of sixty degrees, for fourteen days, and then the liquid should be strained off and the other ingredients mixed. The scalp to be thoroughly washed with this night and morning.

AN EXCELLENT HAIR CLEANSER.—The celebrated Lola Montez, the Countess of Landsfeldt, gives the following hair-cleanser, as used by a great beauty of Munich, who had the handsomest hair of any lady in the Bavarian capital.

Beat up the white of four eggs into a froth, and rub that thoroughly into the roots of the hair. Leave it to dry on. Then wash the head and hair clean with a mixture of equal parts of rum and rose-water. This is said to be one of the best cleaners and brighteners of the hair ever used.

HONEY-WATER.—This celebrated wash, known to fashionable ladies all over the world, is made as follows:

℞ Essence of ambergris	1 drachm
Essence of musk	1 drachm
Essence of bergamot	2 drachm
Oil of cloves	15 drops
Orange-flower water	4 ounces
Spirits of wine	5 ounces
Distilled water	4 ounces

All these ingredients should be mixed together, and left about fourteen days, and then the whole to be filtered through porous paper and bottled for use. This is a good hair-wash and an excellent perfume.

TO PREVENT HAIR FROM TURNING GREY.—A retired Spanish actress warded off the approach of grey hairs by using the following preparation whenever she dressed her head:

℞ Oxide of bismuth4 drachms
 Spermaceti4 drachms
 Pure hog's lard4 ounces

The lard and spermaceti should be melted together, and when they begin to cool stir in the bismuth. It may be perfumed to your liking.

HOW TO COLOR GREY HAIR.—The following recipe was given by an old physician and chemist, at Lisbon, to a fashionable Parisian lady.

℞ Gallic acid10 grs
 Acetic acid1 ounce
 Tinct. of sesqui-chloride of iron...1 ounce

Dissolve the gallic acid in the tincture of sesqui-chloride of iron, and then add the acetic acid. Before using this preparation, the hair should be thoroughly washed with soap and water. A great and desirable peculiarity of this dye is, that it can be so applied as to color the hair either black or the brighter shade of brown. If black is the color desired, the preparation should be applied while the hair is moist, and for brown it should not be used till the hair is perfectly dry. The way to apply the compound is to dip the points of a fine comb into it until the interstices are filled with the fluid, then gently draw the comb through the hair, commencing at the roots, till the dye has perceptibly taken effect. When the hair is entirely dry, oil and brush it as usual.

POMADE AGAINST BALDNESS.—The following is considered a most valuable preparation: Take of extract of yellow Peruvian bark, fifteen grains; extract of rhatany root, eight grains; extract of burdock root and oil of nutmegs (fixed), of each two drachms; camphor (dissolved with spirits of wine), fifteen grains; beef-marrow, two ounces; best olive oil, one ounce; citron juice, half a drachm; aromatic essential oil, as much as sufficient to render it fragrant; mix and make into an ointment. Two drachms of bergamot, and a few drops of otto of roses would suffice.

PALMA CHRISTI OIL.—Take an ounce of Palma christi

oil; add oil of Bergamot, or lavender to scent it. Let it be well brushed into the hair twice a day for two or three months—particularly applying it to those parts where it may be most desirable to render the hair most luxuriant. This is a simple and valuable oil, and not in the hands of any monopolist.

HOW TO DARKEN THE HAIR.—Wash the head with spring water and comb the hair in the sun, having dipped the comb in oil of tar. Do this about three times a day, and in less than a fortnight the hair often becomes quite black.

A QUICK HAIR DYE.—Hair may be dyed black in a few seconds by moistening it first with a solution of nitric of silver in water (one to seven or eight), and then with a weak solution of hydro-sulphurate of ammonia. Constantly using a leaden comb darkens the color of the hair.

HAIR-WASH.—A good hair-wash is soap and water, and the oftener it is applied the freer the surface of the head will be from scurf. The hair-brush should also be kept in requisition morning and evening.

TO REMOVE SUPERFLUOUS HAIR.—With those who dislike the use of arsenic, the following is used for removing superfluous hair from the skin: Lime, one ounce; carbonate of potash, two ounces; charcoal powder, one drachm. For use, make it into a paste with a little warm water, and apply it to the part, previously shaved close. As soon as it has become thoroughly dry, it may be washed off with a little warm water.

HAIR DEPILATORY.—It is proper to remark that all depilatories either act mechanically or chemically. To the first belong adhesive plasters, which on their removal from the skin bring away the hair with them; equal parts of pitch and resin spread on leather, has been used for this purpose. To the second class belong those substances which act upon the bulbous roots of the hair, and destroy their vitality. The former method is more painful, but less dangerous than the latter one.

STRUCTURE OF THE TEETH.

EVERY tooth is divided into three parts: The *Body*, or portion projecting from the gum and covered with the enamel; the *Root*, or fang, which is received into the socket; and the *Neck*, which connects the body and fang together. The body of the tooth contains a central cavity, that extends into the fang or root, which is the seat of sensation and nutriment.

The *first* teeth are called *deciduous* or milk teeth, and are twenty in number, ten upon each jaw.

The *second* teeth are called *permanent teeth*, and consist of thirty-two, or sixteen upon each jaw.

The structure of the deciduous and permanent teeth are the same, and composed of three distinct parts, viz., *Dental*, *Enamel*, and *Cement*.

MODE OF PRESERVING CHILDREN'S TEETH.

When a tooth commences to decay, it is upon the external surface, gradually extending toward the internal parts of the tooth. If no effort is made to arrest the decay, the destruction of the tooth proceeds rapidly on toward the internal cavity, while the exposure of the pulp or nerve causes the toothache. When a tooth commences to decay, it should be examined by a dentist, and the decayed part removed and the cavity filled with gold.

The decay of teeth is often hereditary. This might be avoided, in many instances, by proper attention to them in childhood. After the first teeth make their appearance, care should be taken to keep them in a cleanly condition. The mouth of the child should be washed once or twice a day with a linen rag saturated with cold water, while the first appearance of decay should be attended to at once by a dentist.

Some mothers are exceedingly anxious for their children to present an attractive appearance, and will spend several

hours a day in dressing and curling their hair, while they appear totally indifferent about the teeth. What is more offensive than decayed or blackened teeth, in a child or female? It presents a more unseemly appearance than uncombed hair or tattered garments. When a child becomes old enough it should be taught to use, and made to employ a tooth-brush night and morning, while a piece of floss silk should also be passed between the teeth after every cleansing. This will prevent the tartar from forming.

Children's teeth when they are undergoing decay sometimes cause intense pain to the individual. When such is the case, dissolve four parts of mastic in one part of ether, in a well-stopped bottle. With this solution, which is of an oily consistency, saturate a piece of cotton wool and press it into the cavity of the tooth. The ether soon evaporates and the mastic forms a coating to the diseased surface and protects it from the air and food.

Children's teeth should not be removed even if they are decayed, unless they are loose and creating mischief, because of the existing connection between them and the permanent teeth, inducing them to assume an irregular position.

At from five to seven years of age, it will be observed that the arch of the jaw elongates posteriorly, and that an entirely new double tooth has taken up a position behind the last double one of the first set. This occurs on the upper and lower jaw, and upon both sides, and is indicative of the commencement of the second set. Spaces may also be noticed between all the teeth, showing that the arch of the jaw is expanding for the reception of the second supply of teeth, which teeth are much larger than those of the first set.

When the double teeth make their appearance, the front ones of the first set become loose, and should be at once removed, in order to prevent the second set from being crooked or having a wrong direction. This changing of teeth continues until about the twelfth year, when **all the**

teeth of the first set will be superseded by new ones. At from twelve to fourteen years, another double tooth will appear in the rear of the arch on both sides, upper and lower, when there is seemingly a pause or suspension of their growth until the sixteenth year. From that time until the twenty-fourth year, and sometimes later, the wisdom teeth make their appearance. Thus we find that there are three important facts to be borne in mind in regard to children's teeth, viz.:

1. The teeth should not be removed too soon.
2. They should be removed when the others have appeared, and are interfering with them.
3. Whenever a new tooth has not sufficient space to assume a regular position, a dentist should be consulted.

The children's teeth should be examined every sixth month during the shedding of old and the development of new ones, in order to keep the latter regular, clean and sound. The advice already given, if attended to, will not only preserve the teeth, but assist materially the beauty of the permanent ones.

THE ART OF PRESERVING PERMANENT TEETH.

Every individual can do much toward the preservation of the teeth. The principal means to this end is to keep them clean. To do this properly they should be well brushed inside and out and on the surface, night and morning, while the interstices between them should be manipulated by using a linen or silk thread, so as to prevent particles of food from accumulating about them, thus inducing their decay and a fetid breath. The tooth-brush should be rather hard but not too wide, while the bristles should be reasonably loose, pliable and elastic. Should the brush be even hard enough to produce slight bleeding of the gums, it will not prove prejudicial.

Tooth powder should be used once a day, in the morning in preference to the evening, inasmuch as the teeth during

the night are more liable to become coated with impurities. The utmost care must be observed in selecting a proper tooth-powder. Some of those that are highly recommended contain certain acids, which will injure the teeth if not utterly destroy them. The tooth-powder should be composed only of such ingredients that will exert a cleansing effect and preserve the healthiness of the gums.

When the tooth-brush is properly used twice a day with cold water, it will generally be sufficient to cleanse the teeth and prevent the tartar from forming. Castile soap is easily procured, and will prove an excellent means to neutralize any acid secretion, remove tartar, clean the teeth, and purify the breath.

The following dentifrice is much recommended by dentists, viz. :—

Prepared chalk, two parts.

Pulverized orris root, two parts.

Pulverized pumice-stone, one part.

Any of the essential oils, a few drops.

This may be used twice a week, in the morning particularly, should there be any accumulation of tartar. The Castile soap and cold water should not be omitted even for a single day. Rinse the mouth with cold water after using the foregoing dentifrice. A few drops of Eau-de-Cologne, Pellitory of Spain, or other tincture, may be used as a fragrant and salutary addition.

Rinse the mouth with cold water after every meal. The tooth-pick should not be of metal, but made of a piece of wood or a quill, not omitting to pass a silk or linen thread between each tooth, as before directed, daily.

DISEASE OF GUMS.

The gums are liable to disease, and produce by consequence much suffering and trouble. They first become inflamed, swollen and congested with blood. Sometimes the edges become thickened and upon pressure discharge mat-

ter. They are also sensitive and bleed freely. If this condition be not arrested, the disease will extend to the sockets and affect the teeth, causing suppuration, so that they become loose and drop out. This affection of the gums is generally called scurvy, and is principally occasioned by the accumulation of tartar upon the teeth. The same condition may result from disease, or decay of the roots of the teeth, or from the improper use of mercury.

Treatment.—First remove the cause of irritation. Should it be tartar, have it removed. If a decayed tooth, have it extracted. If it be mercury, abandon its use, and resort to the remedies already mentioned.

When the cause is removed and the gums continue much inflamed, leeches should be applied; or the gums may be scarified and warm water held in the mouth to induce or promote bleeding. After this, use some astringent wash. A very good one is as follows: Take a pound of the inner bark of white oak, add three quarts of boiling water and boil it down to a quart; strain and wash the gums several times a day with the preparation.

Or the following may be substituted:—

℞ Tanic acid	½ ounce
Pulverized alum	½ ounce
Spring water	I pint

CHAPTER XXX.

CAUSE AND TREATMENT OF FOUL BREATHS.

FOUL breath is occasioned by a variety of causes. Some of the most common are: Decayed teeth, perverted secretion of the salivary and mucous glands of the mouth, uncleanliness of the teeth, etc. The more obstinate cases result from an imperfect assimilation, or vitalization of the food, dependent upon a derangement of the liver or mesenteric glands; or it may be occasioned by a foul stomach.

A frequent cause of foul breath is a torpidity of some one of the excretory organs, such as the skin, kidneys, or bowels. I have known the most offensive breath arise from obstinate constipation of the bowels, the lungs eliminating a portion of what should be thrown off from them.

Should any one of the excretory organs, as the skin, kidneys, bowels, liver or lungs, cease performing their functions, one of the others will be called upon to perform an extra office. In this way, when the bowels or skin become affected, the lungs, being an excretory organ, will be called upon to throw off an additional waste from the system. If so, the breath becomes tainted.

Again, if the food is improperly assimilated by the liver or mesenteric glands, it cannot serve the purposes of nutrition. It is broken up or disintegrated by coming in contact with the oxygen of the blood, and eliminated by one of the excretory organs. If by the lungs, the breath becomes tainted. The excretory organs are all to be regarded as outlets of the system, for the purpose of eliminating decayed and waste material.

Treatment.—We must find out the cause that produces the foul breath. If the teeth be decayed, they are to be removed; those not too far gone should be plugged. The

teeth are to be frequently cleansed with Castile soap and water. If the secretions of the mouth are in fault, the teeth and mouth may be washed two or three times a day with eight or ten drops of the chloride of soda in a tumbler of water.

Should the foul breath be depending upon the stomach, it must be corrected by proper diet, and judicious treatment, recommended by some skillful physician. If the skin be dry and flaky, it should be well-sponged once or twice a day with salt and water, or with soap and water. A small quantity of common whiskey may be added, and the skin, after the sponging, be well rubbed with a coarse crash towel. It is of the utmost importance to keep the skin in a clean and pliable condition, in order to maintain good health. This can only be done by the free use of water. Bathing should be resorted to once a day during the summer season or warm weather, and two or three times a week during the winter season. The chill may or may not be taken off the water during the cold weather, at the option of the patient.

The following may be used when the secretions of the mouth and teeth are in fault:

TO SECURE A FRAGRANT BREATH.—Take two ounces of powder of myrrh; eight ounces of Peruvian bark; thirty-two drops of oil of cinnamon; thirty-two drops of oil of cloves; twenty-four ounces of prepared chalk; eight ounces of orris powder; three ounces of rose pink. Mix well together and use the brush.

A BAD BREATH.—Gum catechu, two ounces; white sugar, four ounces; orris powder, one ounce. Make them into a paste with mucilage, and add two drops of veroli.

CHAPTER XXXI.

WHAT AND HOW TO EAT.

Proper care of the stomach. What digestion means. Mouth Digestion. Stomach Digestion. Intestinal Digestion. Foods and their classification. Fish, oysters, clams, lobsters and shrimps. Eggs, milk, buttermilk, goat's milk. Cheese, meats, fowls, fruit, apples, peaches and pears. Quinces, grapes, raisins, figs and prunes. Oranges, pineapples, nuts, small fruits, vegetables, potatoes, rice, barley, beans, onions, carrots, cabbage and turnips, bread.

It is evident that the stomach is one of the most important organs of the body. It receives and in a great measure prepares the food that nourishes every organ and tissue of the body. It is the food we eat that makes the blood, and if the blood is impure or laden with improper substances we must expect the whole organism to be affected. Without good, rich blood the heart becomes weak, the liver becomes obstructed and the kidneys are overburdened, and other organs are endangered.

To properly care for the stomach is a matter of great concern to everyone; and to know what to eat and how to eat means to know how to prolong life and to avoid sickness. Many persons of delicate constitutions are able to keep well and live to old age by observing the rules of proper eating; while, on the other hand, many who are naturally endowed with robust constitutions are continually suffering from sickness and die early, because they disregard all laws of health and eat improperly.

Before we speak of foods and their properties let us glance at the process of digestion, that we may better understand

the physiology of eating and the reasons for selecting suitable foods.

WHAT DIGESTION MEANS.

Many people think that the stomach is the only organ that digests food, and have very little idea of what digestion really means or how it is accomplished. The digestion of food means its proper preparation for being taken up by the blood current and carried to the various parts of the body to nourish tissues.

There are a great many different kinds of structures and tissues in the human body and they are all constructed out of the food we eat. But that food must be varied in character to meet the requirements and must be suitably prepared for its assimilation. The different processes involved in the digestion of food are interesting.

First, the mouth has an important part to play. When food is received it excites the action of what are known as the salivary glands, which secrete the saliva. This saliva has an active principle, called ptyalin, which, when mingled with the food, partially digests it. To get the full benefit of its action it must be thoroughly mixed with the food, which is accomplished by the act of chewing. This also excites the salivary glands and causes an increased flow of saliva, which serves to moisten the food as well as help digest it. Thus it can be readily understood that all food must be thoroughly masticated; not merely to make it moist and fine enough to swallow, but to mix it well with the ptyalin which partially digests it and prepares it for the stomach. Rapid eating is a prolific source of dyspepsia. Even mush and all other soft foods should be chewed about in the mouth before being swallowed, so as to render them easy of digestion. Those who observe this rule will avoid much trouble.

The stomach is one of the most important organs of the body, for if it fails to do its duty the whole organism soon

becomes affected. It is composed of various layers of muscular fibers, so arranged that when food enters the stomach it excites a churning motion, which still further reduces the food and mingles with it the digestive fluids secreted by the glands of the inner lining of the stomach. These fluids combined, are called the gastric juice and include pepsin and rennet, mucus and acid. Gastric juice is essential to digestion, and in the healthy stomach it is easily secreted. The odor of palatable food or merely sipping some agreeable fluid or chewing upon something pleasant to the taste, will excite the glands of the stomach and cause the secretion of gastric juice. That is why the limited use of chewing gum after meals may aid digestion. When fluids are taken to excess, they will often so greatly dilute the gastric juice that it will not have strength enough to digest food, and therefore very little drinking at meals is best. To chill the stomach will retard digestion and to heat it by using warm soup before eating, will aid digestion. Foods that are not digested are liable, under the influence of the warmth and moisture of the stomach, to ferment and cause the evolution of gas. This distends the stomach and causes pressure against the lungs and heart, producing symptoms often mistaken for heart-disease, and also weakening the stomach by the distension of its walls and by the presence of the irritating, fermenting substances. After the food has been masticated in the mouth and thoroughly mixed with the active principles of the saliva, and after it has been acted upon by the gastric juice and reduced to the finest division by the action of the stomach, it is still not entirely digested; but ready to enter the intestines where the process of digestion is completed. Directly beneath the stomach is a hammer-shaped organ called the Pancreas, ordinarily known as the "sweet-bread." It secretes a fluid containing a principle called Pancreatine, which performs as important a part in digestion as pepsin does. The pancreatic fluid empties into the small intestines, where it mingles with the food. Be-

sides this there is the bile from the liver, which stimulates the bowels, keeps the food alkaline and moist and prevents fermentation. Then there are small glands in the intestines which have their special offices to perform.

Thus it will be seen that digestion is a complicated process and after it is completed, the food is in a condition to be absorbed and taken into the circulation to be carried as blood to all the tissues of the body, to nourish them and supply the material necessary to carry on the wonderful mechanism of the living body.

There are a great variety of tissues in the body; and to develop and maintain them it is necessary to eat a variety of foods. The substances we eat contain different kinds of principles, adapted to the needs of the different classes of structures to be nourished.

First, there are muscle producing foods, called nitrogenous foods. These embrace such articles as lean meats, eggs, cheese, albuminous substances, casein of milk, peas, beans, lentils, etc.

Second, there are the carbohydrates, or fat producing foods, which contain sugar or starch; among these are potatoes, corn, wheat, oats and grains of all kinds.

Third, are the heat producing or carbonaceous foods. Fats, suets, butter, lard and oils of all kinds belong to this class.

Water is a necessary solvent and salt is valuable, of themselves they are not strictly foods, although vegetables and all fruits contain certain quantities of various salts of lime, soda, potash, magnesium, iron, etc.

Nitrogenous or albuminous foods are chiefly digested in the stomach, while the fats and starchy foods are acted upon in the upper intestines and by the ptylin contained in the saliva. Such articles should be well masticated to insure mouth digestion.

A mixed diet is always best, although certain diseased conditions may require abstinence from starchy or albumin-

ous or fatty foods. Reasonably, more heat producing foods can be eaten in winter than in summer. By a wise provision of nature most of the articles we use as food contain definite proportions of all the constituents, with some greatly in excess of others, which permits of the classification given above.

FISH.—Good fresh fish constitutes healthful food when taken in conjunction with other articles. It contains what are known as phosphates, which are excellent for strengthening the nerves when taken in this form. Usually fish is spoken of as a brain food. It does not of course increase intellectuality, but it does increase the power of nerve resistance. The stolidity of those races such as the Chinese which live principally upon fish, is well known.

An exclusive fish diet is not advisable, but partaking of it at frequent intervals is most beneficial. The religious custom of eating fish instead of meat one day in the week is an excellent hygienic regulation, and should be followed even though not prompted by questions of religion.

There are certain conditions of the stomach which cause a craving for salted fish. This craving should be satisfied, within bounds. We have known persons whose stomachs were so sensitive that the daintiest foods could not be retained, and yet they would relish and thrive upon smoked herring or fish preserved in brine. Fish that is stale should never be eaten, it is poisonous, and while its effects may not be immediately noticed, yet it will prove injurious. Many believe that leprosy is indirectly caused by the eating of half decayed fish.

OYSTERS are enjoyed by most people, although by some they are looked upon with disgust. They do not afford much nourishment, but are often relished by persons who cannot receive ordinary food into the stomach. The oyster "juice" taken cold is decidedly agreeable to most fever patients. It contains considerable nourishment, and its muscilaginous character renders it soothing to the irritated stomach or

bowels. Fried oysters are hard to digest and in conjunction with wine or champaign are liable to excite erotic passions.

CLAMS.—The whole clam should never be eaten except by persons with strong digestive powers. The clam "juice," heated with water (known as clam boullion) and highly seasoned, is a most excellent stimulating broth. Clam chowder is a heavy dish for anyone.

LOBSTERS AND SHRIMPS are both digested with difficulty and are not food for delicate persons. **EELS** are usually too fat for sensitive stomachs. **FROGS LEGS** are perhaps the most easily digested of this class of articles. If stewed in cream they may be eaten and relished by most invalids, but when fried they are far less digestible. **CRABS**, properly prepared (as when boiled), are often a pleasant change, but as usually eaten they are undigestible.

EGGS, strictly fresh, constitute an ideal nourishment. In fact their constituents are all that is necessary in conjunction with water and milk, to support life for a long time; but their constant use turns many against them. They are best eaten "soft boiled" or raw, or poached. When fried or "hard boiled" they are not easily digested. Persons of delicate constitution may be greatly strengthened by eating, each morning, an egg-nog prepared as follows: Beat well in a large drinking glass the yolks of two eggs, add a pinch salt and of sugar and almost fill the glass with half milk and half cream, stir thoroughly and on top place the well beaten white of one egg. Do not add brandy or whiskey to this egg-nog, it would then be harder to digest.

MILK. Fresh, pure cow's milk is hard to get in the cities; but where it can be obtained there is no better and more nourishing fluid. Its more general use would be beneficial. Some persons cannot drink milk without becoming bilious, but in such cases there is usually a need for cleansing the liver. Boiled milk is not good; although sterilized milk is to be preferred when germs are possibly present. It is pre-

pared by placing covered jars of milk in cold water and letting the water come to the scalding point (150) degrees.) It is a bad practice to allow milk to remain in the sick-room. It absorbs germs quickly and becomes unfit for use. The milk supply of the cities has been a matter of great concern. Its adulteration is almost universal, and many infant lives are imperiled by its use. Unless children can be given absolutely pure milk, they had better be fed upon some one of the excellent "prepared foods" for infants. Condensed milks are good when manufactured by responsible firms; but the mixtures of sugar and skim milk so often put into cans, are not fit for use.

BUTTERMILK is greatly enjoyed by many, and is an aid for the digestion of starchy foods. But it must be remembered that too often the sour cream, before being churned, is left in places that cause it to be filled with poisonous germs.

GOATS MILK is extremely nourishing. It costs almost nothing to keep a goat or two in the country and the milk given to delicate women and children will be of great benefit.

CHEESE, made from the entire milk is good. It contains phosphates and nitrates, and besides being a relish it is very nourishing. Of course cheese must be eaten only in small quantities. "Rotten," moldy and very strong cheese will not be digested. Persons suffering from irritated conditions of the kidneys and women in the later months of pregnancy should not eat cheese of any kind.

MEATS.—The formation of human beings is such that a certain proportion of meat is included in a natural diet, and under ordinary circumstances it should be eaten. No one meal should include more than about one-seventh part of meat; and this proportion should not be eaten at every meal.

It is always best to eat meat only at the noon-day meal, although it is becoming common practice to eat the largest amount at seven o'clock dinner. It would be far better to

have the evening meal consist of vegetable articles, and if only a light noon-day luncheon is taken, have the meat in the morning for breakfast. To use it three times a day is not conducive to health. Meat is what is termed nitrogenous food and helps to form muscular tissues. Its chief value lies in its fibres. Children should not be fed upon it until four or five years of age, at the youngest, and older persons will find it to their advantage to eat very little of it.

Broths and beef tea are excellent for invalids in most cases; but the ordinary "beef extracts" are utterly devoid of nourishment and act simply as stimulants. Gelatin or calve's foot jelly may be used to great advantage where bone development is insufficient and when taken freely by pregnant women it helps develop the bony structures of the child.

Broiled, tender beef-steak, rather rare, is the best kind of meat that can be eaten, and pork is the worst. Veal is hard to digest and is liable to cause bowel troubles in children and old persons. Mutton and lamb are good, especially when boiled. If pork is eaten at all, it should be only by persons who have an abundance of out-door exercise, and then the pork should be "corn-fed" and thoroughly cooked. Beside trichinosis possibly being caused from diseased rare pork, other unpleasant conditions may arise where no trichinæ exist. Rich gravies are always liable to cause disturbances of the stomach and should be used very sparingly by even the healthiest.

FOWLS.—There is an impression that fowls of all kinds are easily digested, but this is not correct. Pigeon, chicken, turkey and goose are usually acceptable to most stomachs and digested without difficulty; but duck requires fully four hours for digestion. The dark meat is more easily digested than white meat. For an invalid the thigh of a fowl is best. Fried spring chicken is not easily digested. Chicken broth, if there is not too much fat in it, makes a most nourishing food for invalids. Beef tea is strengthening and mutton

broth is healing. Beef extract, as ordinarily sold, is stimulating to the appetite, but it is not nourishing.

FRUITS.—Good, sound, ripe fruits are among the best articles of diet. They contain sufficient acids to aid digestion and an abundance of nourishment. Their free use will help to regulate the bowels and keep the liver cleansed. When there is a special longing for certain kinds of fruit it is best to satisfy it within bounds. Dried fruits, well prepared, are fair substitutes for fresh fruits; but a great deal of dried fruit upon the market is wormy. It is a good plan to examine under a strong magnifying glass samples of dried fruits before buying. It will be surprising to see the masses of very small worms often found upon the inferior grades. It does not pay to economize at the expense of using unsound food.

To eat food properly, it should be thoroughly masticated and the seeds, skins, and cores thrown away. It is a good plan to eat slightly acid fruits, such as oranges, strawberries or grapes, the first thing in the morning. They are then very acceptable to the stomach and are excellent appetizers, immeasurably better than wines or other alcoholic beverages which simply excite on account of the alcohol they contain. There is an old saying which is worthy of consideration, "In the morning, fruit is gold; at noon, it is silver; and at night it is lead." Many persons cannot eat fruit of any kind at night without suffering from indigestion. Their stomachs are weak and need to be properly treated.

APPLES.—There is probably no fruit so universally healthful and acceptable to the stomach as apples. The more they are eaten the less danger will there be of sickness, all other things being equal. There are a great many varieties of apples, so many, in fact, that every taste may be suited. The kind that suits one may not suit another; but they are all health-giving and nourishing, and their use helps to drive

away disease and prolong life. They are best eaten raw; but stewed apples are good, and for the sick well baked apples are most excellent.

PEACHES AND PEARS.—When these fruits are picked ripe from the trees they are luscious and digestible; but when they are picked green and stowed away in dark closets or drawers to ripen they lose much of their value and often become unfit for use. The skins of these fruits are very undigestible and frequently cause inflammatory conditions of the bowels; they also are liable to produce tartar on the teeth.

QUINCES.—This fruit is rarely eaten raw and is mostly used as a preserve with apples, or in the form of jelly. A good method of preparing quinces for use in time of sickness is to make a thin jelly out of the cores and seeds. This is very mucilaginous and ropy, whence it is often called “quince-rope.” It is soothing for coughs and sore throat and useful after bowel troubles.

GRAPES.—Nearly everyone can eat grapes. They are very nourishing and healthful and give strength. The seeds and skins should not be swallowed. It may be a little difficult at first to separate the seeds from the pulp, but practice will make this easy of accomplishment in the mouth. Accumulations of grape seeds in the pouch of the stomach may cause serious inflammation or great distress. The unfermented wine made from good grapes, will be found very grateful to invalids. It may be kept indefinitely in well sealed bottles.

RAISINS, FIGS AND PRUNES.—When these dried fruits can be secured in good condition, free from worms and mustiness, they are good. When stewed, they are excellent for constipation, and the juice is acceptable to most weak stomachs. They are especially suited to nervous persons and irritable children and are soothing in their influence. An excellent confection for constipation may be prepared by chopping together, very fine, half a pound each of figs and

seeded raisins and prunes and dates, and mixing with them thoroughly one drachm of leptandrin. Of this take a piece about as large as a tablespoonful every night. This mixture can be kept a long time. If constipation is not very pronounced the leptandrin can be omitted and the fruits alone will act as a mild laxative.

ORANGES.—A good orange is delightful. It is the invalid's friend. How grateful to the fevered lips and mouth is the juice of an orange. Many times oranges can be eaten and enjoyed by the dying after everything else is repulsive. To eat an orange properly, cut it crosswise and dig out the pulp with a sharp pointed spoon and leave the inner and outer skins untouched. Oranges aid digestion and contain the vegetable acids needed by the system. They are best eaten immediately before breakfast. A very pleasant confection may be made by soaking orange rinds in salt water for forty-eight hours, then drain them well and sugar them with granulated sugar. A little dried "orange peel" is also useful as an aromatic when added to infusions. Chewing it will often aid the expulsion of gas from the stomach. Grape-fruit is very similar to oranges. They are larger and the rinds are smoother and of a bright yellow. The inner skin is intensely bitter and should be avoided; the pulp is very pleasant and is a decided tonic to the stomach and nerves. It is useful in cases of indigestion and dyspepsia.

PINEAPPLE.—This is a pleasant fruit and when properly prepared by cutting out all the harsh pieces, is very digestible. It is peculiarly valuable in sore throat and diphtheria, the juice alone, frequently taken, will sometimes modify severe throat troubles. Pineapple jelly is usually enjoyed by invalids.

NUTS.—Most persons can eat nuts with benefit; and if eaten properly, they make excellent nerve food, on account of the phosphates they contain. The oil is also highly nutritious. But care must always be exercised in eating nuts, lest they are not digested properly. The fat of the nuts,

which is wholesome and nourishing under ordinary circumstances, changes into an irritating poison when it becomes rancid from fermentation. Usually nuts are eaten after a hearty meal. This is unwise, for an overloaded stomach is liable to result in fermentation. The best time to eat nuts is during a light meal of easily digested foods, or half-way between meals. A little salt taken with nuts will greatly aid their digestion. The prospective mother who can judiciously eat reasonable quantities of nuts and digest them, will greatly add to the healthy condition of her child, especially as to its nervous system and body structures. It is also a fact that nuts are beneficial to the teeth.

SMALL FRUITS.—Berries are greatly enjoyed by some, and they are, as a rule, good food. Persons whose bowels are sensitive or who are constipated, may be troubled by eating raspberries. Many cannot eat strawberries without being subjected to an acid condition of the blood, which causes great itching of the skin. Blackberries are useful in diarrhoea, and are the most nourishing berries. Currants and gooseberries, in small quantities, will often aid the digestion of heavier foods. Blueberries are cooling and acceptable to sensitive stomachs.

VEGETABLES.—We are organized to subsist largely on vegetables and cereals; although an exclusively vegetable diet is unsuitable to our needs. It may prove beneficial for a time to such persons as have been eating meats to excess; but as a rule vegetables should be eaten along with other classes of foods; for an evenly balanced diet, adapted to our needs and our individual temperaments and habits of life will be found of the greatest value. There are many kinds of vegetables and a knowledge of the food characteristics will be valuable.

POTATOES.—These constitute a large bulk of the food of most persons. They contain a great deal of starch, and are classed as "starchy foods." They can be safely eaten in large quantities by persons who take a great deal of out-door

exercise or do considerable work, but others should eat of them sparingly. Many persons suffer from indigestion and constipation simply because they eat too freely of potatoes. Baked potatoes are digested in two hours and a half, and are most excellent food, especially if the skins are eaten with the bulk. Boiled potatoes digest in three hours and fried potatoes take four hours for digestion, and many cannot digest them at all. The entire raw potato consists of seventy-five per cent of water. When this is extracted the residue consists of over sixty per cent of starch. Most of this starch is converted into dextrine by roasting; old potatoes contain less starch than new potatoes.

RICE.—This is about the most easily digested of all foods, when well cooked, one hour being the time usually required for its digestion. For that reason invalids can usually eat rice when other solid foods are unacceptable. It contains over eighty per cent of starch, and for that reason should not be eaten to excess. Races of people who subsist largely upon rice are sluggish and unprogressive, and make very little progress.

BARLEY is very nutritious and should be more generally used. The water in which barley has been boiled for an hour or more, when seasoned, makes an excellent broth for weak stomachs, and invalids whose stomachs refuse to take nourishment of any kind, can often be sustained by frequent small enemas of this plain "barley water."

BEANS.—Besides containing large quantities of carbonaceous or heat producing elements, dried bean contains nearly twenty-five per cent of nitrogenous substance. This renders them highly nutritious and good muscle forming food. Persons who have heavy manual labor to perform can safely eat large quantities of beans; though those of sedentary habits should eat but sparingly of them. They contain a large percentage of waste, and for that reason are apt to cause the evolution of considerable gas in the intestines and occasion much annoyance.

ONIONS, CARROTS, CABBAGE AND TURNIPS are among the harsh vegetables. When boiled, they require from three to four hours for digestion, and an hour less when eaten raw. Some stomachs cannot endure them, and invalids should not eat them, although onion broth is an excellent drink where the glands are obstructed or the kidneys are inactive.

BREAD.—“The staff of life,” too often proves to be the staff of death. The modern baker’s bread is, as a rule, unfit to eat. It is made from pure white flour, and usually whitened by alum. Of late years millers have vied with one another in producing the “whitest flour known.” To accomplish their purpose they employ what is known as “the roller process.” This separates from the flour all portions of the wheat except the parts that are in the least way dark in color and leaves almost pure starch, to be called flour. In the darker portions and outside of the wheat lie all of the most nourishing ingredients,—the phosphates that build up nerve and brain tissues, and the nitrates that give strength and endurance. When we consider that wheat contains every element that is in the body, and no more, it is apparent that it is an ideal food for mankind.

Bread made from the entire wheat is the best food that can be eaten. Make it without an excess of yeast, bake it well and eat it cold. Hot bread and biscuits are injurious to the stomach and teeth. Baking powders, as a rule are not healthful; some of them, especially the alum baking powders, are absolutely harmful. The phosphate baking powders are probably least harmful. The bread known as Swiss-bread bids fair to meet with popular favor. It is made of entire wheat flour, and prepared immediately after the flour is ground by a peculiar process which preserves all the nutritious characteristics. To get the full benefit of bread, it should always be thoroughly masticated. It is then well received and better digested by the stomach and consequently more nutritious to the body.

CHAPTER XXXII.

HOW TO LIVE LONG AND ENJOY LIFE

THE following rules should be studied well and made the guide for daily living. We can have but one life to live in this world; then why not live it well? Nearly all the diseases and ailments can be avoided by knowing beforehand how to live. Our journey is short, at the most, and we should make it as pleasant as possible to ourselves and those about us. Health is the richest blessing in the power of Nature to bestow and we can all receive it at our will. At first it may require efforts to follow strictly the rules of right living; but habit soon makes them easy, for they are but the natural laws of life.

1. KEEP THE MIND AT PEACE.

Worry and fret, temper and anger never accomplish anything but harm. They actually injure the brain cells and cause the formation of poisonous materials that damage the whole nervous system and cause disease. No one can digest a meal while in a fit of anger; and all ugly manifestations prevent the proper performance of functions. Peace of mind is the greatest happiness of life. Cultivate it till it becomes as a second nature. It will help to keep you vigorous and its influence will help all those with whom you are associated. Think twice when tempted to speak or act in anger or even to think in anger. You may add years of happiness to your life by observing this rule.

2. TAKE REGULAR PERIODS OF REST.

The nerves and other tissues of the body cannot be under continual strain without injury. They must have rest from

labor, sufficient to allow them to recuperate from a strain. The regular routine of life is wearing upon the system at best; and when it is possible to secure an occasional change of climate and surrounding, it should be done. Every woman should take a trip away from home at least once a year. The relaxation from household cares and duties for a month, or even a week, will strengthen the body for the work that must be performed. It may seem impossible to take such a vacation, but by good management with the help of a kind husband or other members of the family, it can usually be arranged. Mothers need the rest and change, it will prolong life and increase its happiness.

3. SECURE REGULAR SLEEP.

Nature has made provision for periodical periods of rest during sleep, in which the strength is recuperated and the injuries inflicted upon tissue by the exertions of the day are repaired. The old saying, "early to bed and early to rise," is good advice; provided that when you go to bed you will go to sleep at once, and that you will arise as soon as you wake up. The cares of the day and the possibilities of the morrow are poor bed companions. Dismiss them when you enter your bed-room and make their dismissal emphatic. Let your hours of sleep be regular, and in number as many as the system demands, but no more. Too much sleep is debilitating, and unless the body is peculiarly exhausted, from six to eight hours are sufficient. When it is possible, an afternoon nap of half an hour is always of great benefit.

4. EAT CORRECTLY AND REGULARLY.

In the chapter on "How to Eat," will be found descriptions of the various characteristics of foods and of the process of digestion. Let the meals be regular and avoid eating between meals. Nature seeks rhythmical and periodical actions, and nowhere is it more desirable to satisfy her than in the matter of eating. Never eat to excess, avoid

spices and highly seasoned foods, do not eat when excited or exhausted (a few minutes quietude before meals is best), chew the food slowly and avoid all articles that do not agree with you.

5. DRINK PROPERLY.

Every tissue of the body contains water. It is the fluid that gives form to structures and lubricates the passages. Without it the body would be a shrivelled mass. It is simply an absolute necessity of existence, and that it should be taken in large quantities is apparent to all. Drink pure water, as free as possible from limy substances and perfectly free from organic material. Distilled water is good for a season when the system is clogged with impurities, for it is the greatest known solvent and dissolves the excess of salts that sometimes cause rheumatism and other diseases. As a rule spring or deep well water, as soft as possible, is best to drink. Everyone can estimate the quantity of water that can be used without inconvenience. Let the quantity be large. Avoid drinking much fluid at meal time, as it dilutes the gastric juice and interferes with digestion. Tea and coffee and alcoholic liquors of all kinds are unnatural drinks. They are false stimulants and injure the stomach.

6. BREATHE CORRECTLY.

The blood from the body all comes into the lungs to be purified by the air. How important it is, then, that every precaution should be taken to breathe only pure air and to breathe as much of this air as possible. Take deep and regular inspirations, with the shoulders thrown back, so as to allow the lungs to expand as much as possible. Do not remain in rooms that are laden with poisonous gases and be sure to have the sleeping room well ventilated. Nothing more quickly causes disease than inhaling poisonous gases.

7. KEEP THE SKIN ACTIVE.

This is as important as correct breathing. There are mil-

lions of pores in the skin, through which poisonous, waste material is being given off from the body. If the pores become closed this poisonous material is re-absorbed. Bathe the body frequently in water of a temperature most pleasant and remember that "cleanliness is next to Godliness."

8. TAKE PROPER EXERCISE.

The body was constructed for use, and when not used it soon becomes diseased. Exercise within reasonable bounds is absolutely necessary to maintain health. It equalizes the circulation and distributes nerve force evenly throughout the body. It increases the appetite, aids digestion and helps to get rid of waste material. Do not work to exhaustion and let all exercise, as much as possible, be out of doors.

9. SHUN BAD HABITS.

It is an easy thing to form habits that are detrimental to health. They are too numerous to mention. Do not form them and then no effort need be made to break them.

10. DO NOT INJURE THE BODY.

It is slow suicide to compress the body to "improve the shape." Tight corsets, tight shoes and other similar abominations must be avoided. In addition, never use narcotics or poisons in any form, no matter how great may be the temptation. Such things are by nature calculated to injure and destroy the body. Leave them alone.

CHAPTER XXXIII.

PHYSICAL CULTURE IN THE HOME.

PERFECTION IN HEALTH AND BEAUTY BY MORAL AND PHYSICAL DEVELOPMENT.

THERE is nothing to equal Physical Culture for developing perfect health and beauty and those who would live long and enjoy happy days, with sound health, must habitually be regular in their exercises. The regularity of bodily exercise as a preservative of health is of the utmost importance. Almost all the great and laborious men in the world have been regular in their exercises during their whole life and it is an undisputed fact that all the beautiful women developed their beauty and preserved it by a regular course of physical culture.

There is a prevailing impression that one cannot get good, all-around exercise without going to a regularly appointed gymnasium with an instructor to tell you how, but let us say right here this is not so. There are many ways of taking exercise in your own home, right in your own room, and this chapter gives you the means of availing yourself of them.

Physical Culture will help every man, woman and child in the world, whether lacking mentally or physically, for the exercise stimulates the larger blood vessels, drives blood through the arteries and veins with greater rapidity, more completely purifying it, and thus diffuses a feeling of lightness and cheerfulness over the mind and body, thrusting aside the sullen disposition, the heavy heart, and all that is glooming and agonizing, leaving you healthy and happy. No situation however exalted, no wealth however magnified, no honors however glorious can yield you solid enjoyment unless your mind and body are healthy.

There is one thing above all which is essential in Physical Culture, as in everything else in our lives—that is concentration. When you take up one of these exercises concentrate your mind on it, and do it with all the ability God

has given you, for what's worth doing is worth doing well. Some of these exercises may seem simple, but if so, therein lies their strength, for they are easy to perform, readily learned and very beneficial.

The degree of exercise must, of course, vary with the age, conditions of the individual, but this is only at the beginning, for after one has started it can be increased each day till a thorough course is taken daily.

Dress for Physical Culture exercises must be loose. Whatever garment you have in the way of negligee, kimono, bath robe, etc., should be worn over nightdress. Don't wear a belt, nor even shoes, unless you have the heelless ones. Exercise in a cool room.

Be happy, contented and cheerful; don't worry about anything, particularly yourself; don't let little things annoy you; look on the bright side of everything, and in a short time you will find the luster of blooming health in your cheeks, the glow of strength in your body and beauty in your heart, mind and face.

PROPER BREATHING.

Exercise I.—The first essential of a good figure is to breathe properly. To learn to breathe is to learn the A, B, C of physical health, and it is of special importance that this should precede the education of the outer muscular system, for you must build up from the inside first. Proper breathing should number 8 to 12 inhalations to the minute. If one is not used to breathing rightly, a few deep breaths will cause a dizziness; you should stop then for a few minutes when it will pass away. Take your breathing exercises like this:

Standing—arms to side—muscles relaxed—stand so weight will come on ball of foot—tip the top of the pelvis forward so the back will be slightly bowed forward—by balancing the weight there should be no exertion to raise the body on the ball of the foot. Standing with the back to the wall, the heels, calves, back, shoulders and head should all touch. You then are in the normal standing position. Inhale slowly, taking 5 to 7 seconds for inhalation, 4 to 5 to hold when chest is fully distended, and then let the breath out slowly in 5 to 6 seconds. Take plenty of time for the next inhalation. Practice standing position, then

use this method of breathing while walking. Do it earnestly and you will soon appreciate the benefit.

Begin by taking five of these every night and increase it by three each day. In a couple of weeks you will do this unconsciously. To breathe properly sitting, turn a chair sideways to the wall and sit with your back, shoulders and back of head touching the wall, then breathe same as standing.

Exercise 2.—Assume correct standing position—inhale and raise the body on ball of foot—contract the fingers during inhalation and raise, then hold the usual time—then relax, and descend slowly—during usual time. Practice 3 to 5 minutes.

Exercise 3.—Assume correct standing position—arms straight in front on level with body—wrists so relaxed that hands drop at wrist. Start to exhale—force the last atom of air out of the lungs—inhale slowly and contract the muscles of the arm but not forearm or hand, and fill the lungs until they will hold no more. Next relax and exhale again—repeat four times and on the fourth bring the arms around in a circle straight away from the body and on a level with the shoulders. Repeat four times.

Exercise 4.—Take correct standing position, then relax the muscles so as to permit the whole weight of the body to fall on the left leg, allowing the right leg to bend and the right hip to sag down as far as it may. Now transfer this weight to the right leg and allow the left hip to drop as loosely as possible. On first occasion the exercise should be repeated slowly, and might last one to two minutes.

Exercise 5.—Lie flat on the back, with hands across the abdomen; take a long breath, and raise the legs (with the knees stiffened) until they reach right angles with the body.

Exercise 6.—Lie flat on your back on the floor and throw the arms up over the head until they, too, are extended on the floor, palms up. Now say to yourself, "Somebody is pulling me by the feet and somebody is pulling me by the hands." Stretch your legs down and your arms up just as far as you possibly can.

Exercise 7.—Turn over and lie face downward on the floor. Go through the same stretching process. Repeat it on your right side, then on your left. After stretching on

the floor, come to an erect and correct standing position. Stretch the arms out laterally, palms down.

Exercise 8.—Now bend the body to the right until the right hand is brought to the floor and the left is high in the air. (See Illustration No. 8.) This position must be brought about by the bending of the trunk alone, the arms being motionless all the while. Bend to the left until the left hand touches the floor and the right is up. Back and forth, back and forth.

Aim to keep the knees stiff and to touch the floor at least with the finger tips. (See Illustration No. 8.)

Exercise 9.—Balancing yourself while lying on your back on a piano stool is an art to be acquired gradually. The perfect accomplishment would be to lie as flat, while poising there, as if you were on the floor. Begin by laying the large ironing board across a chair or small table and stretching out full length on it. When this has ceased to be a dizzy sensation, take a smaller board. Then do away with the board altogether and balance across the seat of the chair. (See Illustration No. 9.)

In time you will be ready to take the final step to the piano stool. Stretch the arms out beyond the head as far as you can, then draw them down until the hands are clasped under the head. Stretch and clasp, stretch and clasp in counts of one and two.

Exercise 10.—Look over the house and see if you can't find something to hang from so as to stretch the muscles.

Exercise 11.—Place some article on a shelf just beyond easy reach; reach for it. Do this first with the right arm and then with the left. Take the article down and put it back with each hand in turn. Take advantage of all the help your tiptoes offer.

A woman with a pain in the small of her back should not try all of these up-reaching exercises. What is healthy woman's meat is her poison. If a chronic sufferer from such pain these reaches are most dangerous and may bring on serious disorders.

The delicate woman must gain her relaxation by milder means. Light exercises, particularly mat work, must suffice for her.

Exercise 12.—Lying on your back on the floor, extend the arms straight against your sides. Rise to a sitting posture without bending the knees. Repeat this a number of times.

Exercise 13.—Call in a friend. Induce her to clasp you firmly by the ankles while you lie face downward on the floor. Place yourself so that you can with difficulty reach a door-sill. Clutch it and pull yourself by it until the body is thoroughly stretched.

Don't undertake all of these violent exercises in one night. Choose just enough to make you feel thoroughly relaxed; that will bring about the early sleep, and the early sleep, you know, is beauty sleep.

EXERCISES WITH A HOOP.

Exercise 14.—In the first place, choose a large hoop. Be careful to choose one that is perfectly smooth. Do not run the risk of getting splinters into your hands. Take the hoop outdoors if it is good weather, for all exercise gains infinitely in the open air. If you have within reach a smooth stretch of ground, start off after the rolling hoop (Illustration No. 14), for no woman is too old for wholesome exercise. This exercise is especially recommended for the stout.

Exercise 15.—Jumping the hoop will also reduce flesh, just as jumping the rope will. The reason in all these cases is that the exercise is so violent that it must start a perspiration, and perspiration takes the flesh off.

Exercise 16.—To reduce large hips or increase small ones, lie flat on the floor, face downward. Now slip the hoop over the ankles while you hold the feet raised in the air. As the hoop is large you will be able to slip it over your head and clasp it near the chest with both hands, as shown in the picture (Illustration No. 16). Now pull as hard as you can, making your ankles resist the tugging of your hands. Resist with all the strength of your legs from the hips down.

Lying in the same position, pull your ankles forward with the hoop in regular counts, stretching them back as far as possible on the even counts.

Exercise 17.—Turn over on your back, raise your legs vertically, place the hoop over them and pull them toward your head, forcing them to resist as before. Then go through the counts, drawing them toward the head and stretching them out on the floor as in the previous position.

Exercise 18.—Turn on one side, raise the upper leg straight in the air, throw the hoop over it and proceed as

in the other exercises. Be sure to pull the foot directly up on a line with the upper shoulder; do not let the leg slope forward. Allow yourself ten counts, then turn to the other side and take ten counts with the other foot.

Exercise 19.—To develop the legs (Illustration No. 19), making a strong ankle and rounded calf, try this. Stand on one foot, raise the other a foot or so from the ground and forward. Now put the hoop over it, grasp the hoop with both sides and pull hard, making the foot press forward as you do so. You will feel the effort to keep the leg straight and extended affecting all the muscles from the hip down. Give an equal time to the other foot. Always be careful to let no exercises become one-sided.

Exercise 20.—Don't neglect neck and shoulders. Pass the hoop over the neck, let it rest at the back of the neck, then pull it forward while the neck grows strong by resisting the effort of your hands. Shift the pressure so that the neck resists at each side in turn.

Exercise 21.—An excellent development of the arms is obtained by holding the hoop above the head, keeping it horizontal and holding it with a hand on each side. Now press with the arms, straining as if to part the hoop in two. The right arm is always likely to be strongest, but the left must get its share of the work. Now lower the hoop to the shoulders, still keeping it horizontal, stretch the right arm out to the right side until it is at full length, letting the hoop slide to adapt to the position; stretch the left arm similarly, letting the right arm relax; continue to alternate.

EXERCISES WITH INDIAN CLUBS.

Indian club drill is a common and a simple thing for the student in Physical Culture. It spreads the chest, limbers the arms and does a modest share of muscle building. In addition to these virtues, it trains quickness of hand and is a wonderful school for grace. The grace that you cultivate will not be confined to the club practice alone. It will go into every motion of your daily living.

The clubs should be light, as near one pound as you can get. The weight is not intended to be heavy. You cannot handle the clubs lightly if they are handled with an effort.

Exercise 22.—Come to attention with the most rigid discipline. With the clubs sloped, the elbows are drawn close

to the sides, the forearms are horizontal, and the clubs are resting one on each shoulder.

"Attention" means: "The clubs fall forward and down to a perpendicular position on each side, the thumbs and forefingers grasping the handles, palms to the front, arms straight, and remain perfectly steady."

The first exercise is taken with clubs to the front. Give yourself the command "Attention!" the arms and clubs are to be raised up in front of and in a line with the shoulders. The back of the hand is down while the arms are extended; the body is square to the front. At "Back!" the clubs are drawn sharply back against the body, the handles against the breast and the clubs horizontal. The backs of the hands are still down while the elbows are bent and drawn close to the sides.

"Front!" is to be thus: "Thrust forward the clubs to the full extent of the arms, and allow them to swing smartly to the rear, as far as possible, and at the same time the heels should be raised slightly from the ground, the body inclined forward, shoulders square, head up, chest advanced, eyes to the front."

At "Halt!" you are to resume the "Attention" position. It is intended that these motions be combined as soon as you are used to them, and you can then go through them rapidly. These preliminary motions are merely to accustom you to the handling of the clubs and give you a good standing position in preparation for the swinging to come later on.

No rules can teach you the twist of the wrist that club swinging involves—in fact, the twist is the whole secret. It is a knack that must be acquired by practice alone. (Illustration No. 22.) It makes the wrists supple beyond any exercise in the world and will be well worth your while if you are a pianist. It is best to begin with the right hand alone. When it has acquired the art, the left will imitate it.

Exercise 23.—The first drill in swinging is given in this way: You are commanded to "raise the right elbow in line with the right shoulder, carry the hand close to and behind the right ear; then, with a turn of the wrist, allow the club to swing around as close as possible to the back. When the circle is completed, lower the elbow to the side, bringing the hand in front of the shoulder, club perpendicular."

The above exercise should be practiced with each hand in turn.

Exercise 24.—Bring both clubs up to the chest and perpendicular, the hands in line with the shoulders and the eyes directed upward.

“Raise the right elbow in line with the right shoulder, carry the hand close to and behind the right ear; then, with a turn of the wrist, allow the club to swing round as close as possible to the back, keeping the left club steady and perpendicular, eyes directed towards its top.” (Illustration No. 24.)

Of course, you are to alternate this exercise between the hands, and, of course, you are to become fairly skilled in it before you advance to the others. Take one at a time, giving days to each one.

Exercise 25.—The clubs are to be brought up perpendicularly in front of the chest, the hands on a line with the shoulders. At the command “Slope,” extend the arms to the full extent in front of and in line with the shoulders, clubs perpendicular; relax the grasp with the third and little fingers, and lower the clubs on the shoulders, keeping the arms as straight as possible. At “Front,” extend the arms to the full extent, clubs perpendicular.

Exercise 26.—Requires that the clubs be horizontal. First they are brought up as before to a perpendicular position. Then, at “Lower,” you must lower them by a turn of the wrist to a horizontal position, still in front of the chest, while the handles are touching and the hands on a level with the shoulders, their backs down and the elbows drawn close to the sides. This may sound complex at first reading, but you can work it out if you will. At “Raise,” bring the clubs to a perpendicular once more without moving the elbows from the sides.

Exercise 27.—The clubs begin in the usual perpendicular. The motion is this: “Raise the right elbow in line with the right shoulder, carry the hand behind the right ear, swing the club close to the back, and when the circle is completed from left to right in the rear, form a similar circle in front of the body by carrying the right hand and club across the chest as far as the left shoulder and just in front of the left hand; allow the club to drop parallel with the body, and bring it down with the arm straight in front of the feet;

complete the circle by bending the elbow as the hand and club pass the right leg."

Exercise 28.—Slope the clubs as in the fourth; then, at "Swing," "form a circle with the left club in rear, and at the same time form a circle with the right club in front of the body." Form the circles alternately, with the clubs in front and rear as you progress with the counts. (Illustration No. 28.)

Exercise 29.—Involves some steps and is sometimes performed on the move. "Each step is taken as the clubs swing to the rear, and the advanced knee is bent as the clubs drop behind the shoulders." It is also performed with half-facings instead of forward steps.

EXERCISES IN THE OPEN AIR.

Find a quiet spot and there go through your daily calisthenics, storing up two lungs full of air, a pair of rosy cheeks and any amount of good cheer.

Exercise 30.—The fists are tightly clenched and drawn up against the shoulders so that the thumb end lies against the shoulder and the curled little finger is forward. This position causes the elbows to project forward. The upper arm lies horizontal, on a level with the shoulder; the forearm bends backward and upward, ending with the fist on the shoulder.

From this position as a basis, all the thrusts are made. The forward thrust throws the arm straight out in front with tremendous force. The outward thrust throws the arm straight out at the side. When you try this you will notice that a peculiar bend is required to bring the upper arm back to its forward position. This must be done moderately at first, lest the muscles suffer from it. The upward thrust must straighten the arm vigorously, as shown in the picture. (Illustration No. 30.) The downward thrust will give you more chance to show your force than any other. Sit down, draw your knees up as far as necessary, then clasp each foot by the toe. While in this position rock the body back and forth and from side to side. Still holding the toes, lean back as far as you can without removing the heels from the ground. (Illustration No. 30.)

Exercise 31.—Next, still clasping the toes, tip over backwards until the feet are up in the air. Let the hands fall, straighten the legs upward, then bring them down and return

to the original position. Clasp the toes again and repeat. (Illustration No. 31.)

Exercise 32.—Raise the arms above the head and place the palms together. Bend the body from side to side so that the arms, following its motion, move in a great arc.

Exercise 33.—Roll. There are physical culture teachers who claim that rolling alone can restore health. Lie down and roll as far as you can without tiring yourself out.

Exercise 34.—Lie face downward and raise the heels until they strike the body. Kick rapidly, alternating the right and left foot, then kicking with both together.

Exercise 35.—Lie on one side; let the arms fall loosely; keep the legs extended, one on top of the other. Raise the upper leg repeatedly as high as possible.

Exercise 36.—Starting in the same position, draw the upper leg up along the sand until its knee reaches the chest. This and the above exercise, of course, are to be taken on each side.

Let your hair fall loose, except during exercises where it needs protection.

BEAUTY RECIPES.

COSMETIC JELLY FOR THE HANDS.

Soak sixty grains of whole gum tragacanth in fourteen ounces of rosewater for two days; strain forcibly through muslin, and add one ounce each of alcohol and glycerine. Perfume to suit. Use immediately after bathing.

CREME MARQUISE FOR THE COMPLEXION.

One-quarter ounce of white wax.

Two and one-half ounces of spermaceti.

Two and one-half ounces oil of sweet almonds.

Melt, remove from fire and add:

One and one-half ounces rosewater. Beat till creamy; not till cold. Be sure that your druggist gives you only one-fourth ounce of white wax. More will make it too hard.

ASTRINGENT WASH FOR COARSE PORES, OILY OR FLABBY SKIN.

Take a half-pint bottle and in it put one and one-half ounces of cucumber juice, half fill the bottle with elder flower water, add one ounce of eau de cologne and shake well. Then add one-half ounce of simple tincture of benzoin, shake slightly and fill with elder flower water. Apply with soft sponge night and morning.

ORANGE FLOWER SKIN FOOD FOR WRINKLES.

One-half ounce of white wax.

One-half ounce of spermaceti.

One ounce of cocoanut oil.

One ounce of lanoline.

Two ounces of oil of sweet almonds.

Melt in a porcelain kettle; remove from heat and add:

One ounce of orange flower water,

Three drops of tincture of benzoin.

Beat briskly with egg-beater until creamy.

CHAPTER XXXIV.

HYGIENE AND HOUSEHOLD RECIPES, TABLE OF MEDICINES AND DOSES, TABULATED MATTER, ETC.

TO PURIFY SINKS AND DRAINS.

To one pound of common copperas add one gallon of boiling water, and use when dissolved. The copperas is deadly poison, and should always be carefully labeled if kept on hand. This is one of the best possible cleansers of pipes and drains.

TO WASH GREASY TIN AND IRON.

Pour a few drops of ammonia into every greasy roasting-pan, after half filling the pan with warm water. A bottle of ammonia should always be kept on hand near the sink for such uses; never allow the pans to stand and dry, for it doubles the labor of washing, but pour in water and use the ammonia, and the work is half done.

TO CLEAN CARPETS.

Shake and beat the carpets well; lay them upon the floor and tack them firmly; then, with a clean flannel, wash them over with one quart of bullock's gall mixed with three quarts of soft, cold water, and rub it off with a clean flannel or house-cloth. Any particular dirty spot should be rubbed with pure gall. Carpets cleaned in this way look bright and fresh.

TREATMENT OF OILCLOTH.

Oilcloth ought never to be wetted, but merely rubbed with a flannel and polished with a brush of moderate hardness,

exactly like a mahogany table; and by this means the fading of the colors and the rotting of the canvas are entirely avoided.

FLANNELS.

Flannel should always be washed with white soap, and in warm, but not boiling water.

DAMP CLOSETS.

For a damp closet or cupboard, which is liable to cause mildew, place in it a saucerful of quicklime, and it will not only absorb all apparent dampness, but sweeten and disinfect the space. Renew the lime once a fortnight; if the place be very damp, renew it as often as it becomes slaked. Lime may be used in the same way for water-closets and out-buildings.

DAMP WALLS.

Line the damp part of the wall with sheet lead, rolled very thin, and fastened up with small copper nails; it may be immediately covered with paper, and so hidden from view. The lead is not to be thicker than that which lines tea chests.

WHITEWASH FOR ROOMS.

Take four pounds of whiting and two ounces of common glue; let the glue stand in cold water over night, then heat it until dissolved and pour it hot into the whiting mixed with cold water. This makes a nice, smooth whitewash.

WHITEWASH THAT WILL NOT RUB OFF.

Mix up half a pailful of lime and water ready to put on the wall; then take one-fourth pint of flour, mix it with water, then pour on it sufficient quantity of boiling water to thicken it, and pour it while hot into the whitewash; stir all well together and use.

PAINTING AND PAPERING.

Painting and papering are best done in cold weather, especially the former, for the wood absorbs the oil of paint much more in warm weather, while in cold weather the oil hardens on the outside, making a coat which will protect the wood instead of soaking into it.

MILK PAINT.

Mix water lime with skim-milk to proper constituency to apply with brush, and it is ready for use; it will adhere well to wood, smooth or rough, to brick, mortar, or stone, where oil has not been used, and it forms a very hard substance as durable as the best of paint; any color which is desirable may be had by using colors dissolved in whiskey.

TO CLEAN BRASS.

Finely-rubbed bichromate of potassa, mixed with twice its bulk of sulphuric acid, and an equal quantity of water, will clean the dirtiest brass very quickly.

TO CLEAN BRICKS.

To remove the green that gathers on bricks, pour over them boiling water in which any vegetables, not greasy, have been boiled; repeat for a few days and the green will disappear. For the red wash, melt one ounce of glue in one gallon of water; while hot, add alum the size of an egg, one-half pound Venetian red, one pound Spanish brown; if too light, add more red and brown; if too dark, water. By experimenting, the color desired may be had.

TO POLISH NICKEL PLATE.

Scour with pulverized borax; use hot water and very little soap; rinse in hot water, and rub dry with a clean cloth. By this quick process a bright polish may be had.

CEMENT FOR BROKEN CHINA OR GLASS.

Dissolve one-half ounce of gum arabic in a wine-glassful of boiling water; add plaster-of-Paris sufficient to form a thick paste, and apply it with a brush to the broken parts; being nearly colorless, it is better than liquid glue or other cements.

TO CLEANSE BRASSES, TINS, COPPERS, ETC.

Mix rotten-stone, soft soap, and oil of turpentine to the consistency of stiff putty. The articles should first be washed with hot water to remove grease; then rub the metal with the mixture, mixed with a little water; then rub off briskly with a dry, clean rag or leather, and a beautiful and durable polish will be obtained.

TO REMOVE IRON STAINS FROM MARBLE.

Wet the spots with oil of vitrol, or oxalic acid diluted in alcohol, or with lemon juice, and after a quarter of an hour, rub them dry with a soft linen cloth.

TO CLEAN MARBLE.

Use three ounces of pearl ash, one pound of whiting, and three pints of water well mixed together, and boil for ten minutes; rub it well over the marble and let it remain twenty-four hours, then rub it off, and dry with a clean cloth.

TO CLEAN WOODWORK.

Where painted wainscot or other woodwork requires cleaning, fuller's earth will be found cheap and useful, and, on wood not painted, it forms an excellent substitute for soap. Where extreme nicety is required, use a mixture of one pound of soft soap, two ounces of pearl ash, one pint of lard, and one pint of table beer; simmer these substances

in a pipkin over a slow fire, and let them be well mixed. The mode of application is to put a small quantity in flannel; rub it on the wainscot, wash it off with warm water, and dry thoroughly with a linen cloth. This will clean painted wood-work without removing the paint.

TO CLEAN GILT FRAMES.

When the gilt frames of pictures or looking-glasses, or the gilt mouldings of rooms have specks of dirt upon them, from flies or other causes, they can be cleaned with the white of an egg gently rubbed on with a camel-hair pencil.

TO CLEANSE PICTURE FRAMES.

Black walnut frames will become dull and rusty looking. They may be renewed by first brushing thoroughly with a stiff brush to remove dust, and then apply pure linseed oil with a proper brush, or with a piece of new bleached muslin.

TO REMOVE MOTHS FROM FURNITURE.

Moths may be exterminated or driven from upholstered work by sprinkling this with benzine. The benzine is put in a small watering pot, such as is used for sprinkling house-plants; it does not spot the most delicate silk, and the unpleasant odor passes off in an hour or two in the air. Care must be used not to carry on this work near a fire or flame, as the vapor of benzine is very inflammable. It is said that a little spirits of turpentine added to the water with which floors are washed will prevent the ravages of moths.

PERFUME AND A PREVENTIVE AGAINST MOTHS.

Take one ounce of Tonquin beans, carraway seed, cloves, mace, nutmeg, cinnamon, well ground; add six ounces of Florentine orris root; mix well, and put in bags among your clothes.

TO BLACKEN HEARTHES.

Mix black lead and whites of eggs well beaten together; with a painter's brush wet the hearth thoroughly all over; then scrub it bright with a hard brush.

TO REMOVE FLY SPOTS.

Dip a camel-hair brush into spirits of wine, and apply it to remove fly spots.

MUCILAGE.

An excellent mucilage may be made by taking one ounce of gum tragacanth, as much corrosive sublimate as will lay on a silver five-cent piece; put it into a jar and pour over it one quart of cold, soft water; let it stand twenty-four hours; then stir, and it is ready for use, and it will keep as long a time as is desired.

LIQUID GLUE.

Dissolve 33 parts of best glue, in a steam bath, in 36 parts of water; then add gradually, stirring constantly, 3 parts of nitric acid, or enough to prevent hardening when cold.

HOW TO KEEP MEAT.

Meat is much better for family use when at least one week old in cold weather. Hang up a quarter of meat with the cut end up, the reverse of the usual way, and the juice will remain in the meat and not run to the cut end and dry up by evaporation.

TO RESTORE AND PRESERVE FLOWERS.

Faded flowers may be generally more or less restored by immersing them half way up their stems in very hot water, and allowing them to remain in it until it cools, or they have recovered. The scalded portion of the stem must then be cut off, and the flowers placed in clear, cold water. In this way a great number of faded flowers may be restored; but there are some of the more fugacious kinds on which it proves useless. Flowers may also be preserved and their tints deepened by adding to the water a little solution of

carbonate of ammonium and a few drops of phosphate of sodium. The effect of this in giving the flowers a deeper color and a stronger appearance is quite wonderful; and, by cutting off every other day about half an inch of the stems of the flowers with a sharp knife, they may be kept as long as their natural life would last in the fields or woods.

HINTS FOR THE TOILET.

TO CLEAN HAIR BRUSHES.

Dissolve a piece of soda in some hot water, allowing a piece the size of a walnut to a quart of water; put the water into a basin, and, after combing out the hair from the brushes, dip them, bristles downward, into the water and out again, keeping the backs and handles as free from water as possible. Repeat this until the bristles look clean; then rinse the brushes in a little cold water; shake them well, and wipe the handles and backs with a towel, *but not the bristles*, and set the brushes to dry in the sun, or near the fire. Wiping the bristles of a brush makes them soft, as does also the use of soap.

TO CLEAN COMBS.

If it can be avoided never wash combs, as the water often makes the teeth split, and the horn, if wet, often becomes rough. A small brush can be bought, made purposely for cleaning combs; with this the comb should be well brushed, and afterwards wiped with a cloth.

BANDOLINE.

Soak starch or Irish moss (whichever is handy) in rose water until dissolved and smooth; if you wish it to be pink, color it with a little pounded cochineal.

OIL OF ROSES FOR THE HAIR.

Attar of roses, one drachm; oil of rosemary, one drachm; olive oil, one quart, mixed together. It may be colored red by steeping a little alkanet root in the oil (with heat) before scenting it.

MILK OF ROSES.

Put into a small bottle two ounces of rose water, one teaspoonful of oil of sweet almonds, ten drops of oil of tar. Shake the bottle until the whole is combined; it makes a nice and perfectly harmless cosmetic to apply to the skin after washing.

MARROW POMADE FOR THE HAIR.

Marrow, a quarter pound; lard, a quarter pound; castor oil, six ounces; salad oil, six ounces; palm oil, half ounce; scent with oil of bergamot; melt the lard and palm oil together; then strain it, and strain the marrow; mix all well together, until nearly cold and put in pots.

PERFUME FOR LINEN.

Lavender flowers, half pound (free from stalk); dried thyme and mint, of each, half ounce; ground cloves and caraway, of each, a quarter ounce; common salt dried, one ounce; mix well together, and put into cambric or silk bags.

CHAPPED HANDS.

Unsalted lard, a quarter pound; yolks of two new-laid eggs, rose water to mix well; add a large spoonful of honey, and enough of *fine* oatmeal or almond flour to work it into a paste.

CHAPPED LIPS.

Borax, benjamin, and spermaceti, of each a quarter ounce, a pinch of alkanet root, a large juicy apple chopped, a bunch of black grapes bruised, a quarter pound of unsalted butter, two ounces of bees wax; put all into a new tin saucepan; simmer gently till the wax, etc., are dissolved, and then strain it through a linen; when cold, melt it again and pour it into small pots or boxes; or, if to make in form of cakes, use the bottom of teacups.

EXCESSIVE SWEATING OF THE HANDS OR FEET.

A useful prescription for excessive sweating of the hands and feet, is: Carbolic acid, one part; burnt alum, four parts; starch, two hundred parts; French chalk, fifty parts; oil of lemon, two parts; sprinkle on feet, or inside of stockings or gloves, etc.

CHILBLAINS.

Wash the chilblains with tincture of myrrh diluted in a little water.

BURNS.

Lime water beaten up with sweet oil is an excellent ointment for painful burns.

HAEMMORRHOIDS OR PILES.

They may generally be prevented from developing by proper attention to the bowels. Eat freely of laxative food, such as rye bread, Indian meal in any form with molasses, rye pudding, coarse or unbolted wheat bread, potatoes, fruit, stewed peaches, etc.

Treatment.—When the tumors become very painful and are considerably inflamed, apply a poultice made of pulverized slippery elm bark and milk, or a poultice made of common lobelia inflata and fresh butter in the proportion of one part of the former to two of the latter; simmer and strain; apply two or three times a day.

The following remedy is used with remarkable success by the United States government in the army and navy, and will cure almost any case of long standing in twenty-one days:

℞ Citrine OintmentI ounce
Rosinous OintmentI ounce

Mix, apply a small quantity to the rectum, rub in well night and morning every other day. *Caution.*—Follow di-

rections explicitly; if used more freely than directed it will burn.

SPRAINS.

Sal ammoniac, half an ounce; rose water, half pint; cologne water, a tablespoonful. Rags wet with the lotion should be laid on the injured part, and changed when they get dry.

SUNBURN.

This may occur in grade from a slight reddening of the face to an inflammation attended with blistering. Soothing applications and avoiding the cause are the indications. Oxide of zinc ointment, cosmoline and zinc ointment, in equal parts, or dusting powders of starch or rice flour, are useful. A solution of subnitrate of bismuth, or bicarbonate of soda, has some value for removing freckles. Powdered nitre, moistened with water and applied to the face night and morning, has also been recommended for removing freckles.

INSTRUCTIVE TABLES.

TABLE SHOWING THE DEATH RATE PER 1000 OF EACH SEX IN EACH OF THE THREE CONDITIONS OF LIFE.

AGES.	MALES.			FEMALES.		
	<i>Unmarried.</i>	<i>Married.</i>	<i>Widowers.</i>	<i>Unmarried.</i>	<i>Married.</i>	<i>Widows.</i>
20-25.....	12.89	8.92	49.60	8.32	9.92	12.31
25-30.....	10.17	6.24	21.84	9.02	8.98	29.62
30-35.....	11.51	6.82	19.17	9.87	9.36	16.90
35-40.....	13.15	7.52	17.59	10.87	9.29	15.03
40-45.....	16.62	9.55	18.89	13.28	10.14	12.73
45-50.....	19.60	11.47	22.20	15.71	10.69	13.30
50-55.....	25.80	15.61	26.80	20.97	14.11	15.20
55-60.....	32.10	21.50	34.17	26.90	19.29	24.47
60-65.....	45.92	32.60	47.50	40.52	30.75	37.07
65-70.....	58.50	44.80	62.97	53.30	45.30	53.50

GLOSSARY

OF THE

MEDICAL, SCIENTIFIC AND OTHER TERMS EMPLOYED IN THIS WORK.

Abdomen. The cavity situated between the lower part of the thorax and the region of the pelvis, containing the intestines, etc.

Abnormal. Unhealthy, unnatural.

Abortion. Miscarriage.

Abrasion. Excoriation.

Abscess. Cavity containing pus.

Absorbents. The lacteals and lymphatic vessels.

Absorption. The act of taking or sucking up.

Acacia. Gum Arabic.

Acetate. A salt containing acetic acid, united to a base.

Acetic Acid. Vinegar.

Acetic Tincture. A tincture made with vinegar.

Aconite. Monkshood. A native of Europe. This plant is cultivated in gardens as an ornament. It is extensively used as a febrifuge.

Acme. Height of disease.

Adipose. Fatty.

Afferent. Name of lymphatics conveying lymph to the glands; also, nerves which convey impressions to the brain and spinal cord.

Afflux. The act of flowing to.

Ague-chill. The cold stage of an intermittent.

Albumen. A substance found in animals and vegetables, and which constitutes the chief part of the white of eggs.

Alcohol. Rectified spirits of wine.

Aliment. Any kind of food.

Alimentary Canal. The entire passage through which the food passes from the mouth to the anus.

Alkali. A substance having a metallic base, which neutralizes acids, as potash, soda, ammonia, etc.

Aloes. The inspissated juice of the Aloe spicata.

Alteratives. Medicines intended to change the morbid action by restoring the healthy functions of the secretions, etc., by a gradual process.

Alum. Super-sulphate of alumina and potash.

Alvine. Relating to the intestines.

Ammonia. Volatile alkali.

Amenorrhœa. Absence of the menses.

Anæmia. An impoverished state of the blood.

Analysis. Resolution of a compound body into its elements.

Anatomy. Dissection. Knowledge of the parts of the body.

Androgyni. (*Plural.*) A term applied to Hermaphrodites in whom the male characteristics predominate.

Androgynæ. (*Plural.*) Those Hermaphrodites in whom the female peculiarities are most apparent.

Androgynus. A Male Hermaphrodite.

Androgyna. A Female Hermaphrodite.

Aneurism. Morbid enlargement of a vessel or vessels.

Anima Mundi. Soul of the Universe.

Antidote. A medicine given to destroy or counteract a poison.

Antimony. A metal used in medicine.

Anus. The inferior opening of the rectum.

Aorta. The large artery passing from the heart.

Aphides. Plant lice.

Aphis. A plant louse.

Areolæ. The interstices between fibers composing organs.

Artery. The name of a blood-vessel which conveys blood from the heart,

- Astringents.* Medicines used to contract the animal fibre.
- Athletæ.* Men trained to feats of strength, endurance, etc., among the ancient Greeks.
- Axilla.* The arm-pit.
- Balsam Copaiba.* Liquid resin used for inflammation of mucous membrane.
- Battery.* Galvanic. A connected series of copper and zinc plates, alternately arranged, with acid and water.
- Belladonna.* Deadly Night-shade.
- Bicuspides.* The first grinding teeth, molars.
- Bifurcate.* To divide into two branches.
- Bile.* A yellowish fluid secreted by the liver.
- Camphor.* A valuable antispasmodic and nervine.
- Canula.* A hollow tube.
- Cantharides.* Spanish flies, for blistering.
- Capillaries.* Hair-like vessels for conveying the blood from the arteries to the veins.
- Capsicum.* Red pepper, or Cayenne.
- Cartilage.* Grizzle.
- Catamenia.* The menstrual flux.
- Catheter.* A hollow silver tube used for evacuating the bladder.
- Caustic.* A substance which destroys parts by combining chemically, or disorganizing them.
- Celibacy.* The unmarried state.
- Cervex Uteri.* Neck of the womb.
- Chalazæ.* The dense internal albumen of the egg, in the form of spirally-twisted bands, produced by the revolving motion of the egg in its descent through the oviduct.
- Chlorine.* An elementary gas.
- Chlorosis.* Green sickness.
- Cholera Infantum.* Summer complaint of children.
- Cicatrix.* A scar.
- Cicatrization.* Process of healing.
- Citric acid.* Acid of lemons.

- Ciliary.* Resembling small hairs, attached to cells of the mucous membrane.
- Clitoris.* A body resembling a male penis, situated below the mons veneris, above the entrance to vagina, within the labials.
- Colostrum.* An unhealthy condition of milk, or of the lacteal secretions.
- Coma.* Insensibility.
- Conception.* The impregnation of the ovum by the positive contact of the male sperm, whence results a new being.
- Congestion.* Overfullness of the blood-vessels.
- Congenital.* Being present at birth.
- Constipation.* Costiveness.
- Consumption.* Wasting away.
- Contagion.* Propagation of disease.
- Continent.* Virtuous. Abstinence from venereal or sexual indulgences.
- Corpus Luteum.* A cicatrix or scar. A small yellowish body perceived in the ovarium, and left after the rupture of one of the ova vesicles.
- Corrugated.* Wrinkled.
- Croup.* Inflammation of the trachea.
- Cyst.* Sac, bag, or pouch.
- Decoction.* Preparation made by steeping.
- Dental.* Appertaining to the teeth.
- Dentition.* Process of cutting the teeth.
- Depletion.* Diminishing the fullness of a part by evacuating remedies.
- Derangement.* Applied to functional disturbance of the organs.
- Dermoid.* Resembling the skin.
- Desideratum.* Something needed.
- Desquamation.* Scaling off.
- Determination.* Unnatural flow of blood to the part.
- Diagnosis.* Distinction of maladies.

- Diagnostic.* Characteristic of disease.
- Diathesis.* Constitutional tendency.
- Digestion.* Conversion of food into a liquid substance called chyme.
- Disorganization.* Destruction of an organ or tissue by disease, etc.
- Dissection.* The anatomical examination of the parts of the body.
- Drachm, or dram (ʒ).* Sixty grains by weight, and an ordinary teaspoonful by measure.
- Drastic.* Powerful purge.
- Dysmenorrhœa.* Painful menstruation.
- Element.* A simple constituent or principle of the body, or any other substance.
- Emaciation.* Wasting away.
- Emesis.* Vomiting.
- Emetics.* Medicines provoking vomiting.
- Emmenagogues.* Medicines believed to have the power of acting on the uterus or womb and exciting the menses.
- Ecrasseur.* A surgical instrument.
- Erotic.* Excessive venery.
- Enamel.* Outer surface of the teeth.
- Embryo.* The young being in the womb.
- Encysted.* Covered with a sac.
- Enema.* Injection into the rectum.
- Epithelium.* The thin layer of cells which covers the nipples, lips, mucous membrane, etc.
- Epigenemal.* Relating to generation.
- Epigenesis.* Generation. A theory of conception, according to which the new being is created entirely new, and receives at once from each parent all that is necessary for its formation.
- Evolution.* Development of germs.
- Exacerbation.* Aggravation of fever or other disease.
- Excretion.* Substances secreted and thrown off from the

- body, as urine, perspiration, etc.
- Exhalants.* Vessels which throw out.
- Fallopian Tubes.* The ducts which convey the ova from the ovaries to the womb, and the semen toward the ovaries.
- Febrifuge.* Medicine to subdue fever.
- Febrile.* Belonging to fever.
- Fecundation.* Impregnation. The power to produce young.
- Fistula.* Deep-seated ulcer, with a tube or canal opening externally.
- Flaccid.* Soft, pliable, relaxed.
- Fœtus.* The young being in the womb passed from the embryo stage, four months after conception.
- Follicle.* A little bag or depression in the mucous membrane lined with secreting cells.
- Formula.* Prescription for preparing medicine.
- Function.* The action by which vital phenomena are produced in the living body.
- Generation.* Producing kind, procreation, formation, etc.
- Genus Homo.* The human race.
- Gland.* Applied to those organs which separate from the blood any fluid whatever.
- Globule.* A small globe. The blood is composed of globules, the red and white.
- Gonorrhœa.* Flux or discharge from inflammation of urethra.
- Hermaphroditism.* A blending of the male and female sex in one person.
- Hermaphrodite.* Partaking of the character of male and female in one person.
- Heteradelphìa.* A monstrosity, or double animal, or having duplicate organs.
- Homunculi.* Miniature representations of men, which the ancients imagined to exist in the semen. *Animalculæ* of the male sperm.

- Hybrid.* An unnatural mixture of distinct animals, as the male ass with the female horse. A mule.
- Hydatids.* A species of encysted entozoa.
- Hygiene.* The art of preserving health.
- Hymen.* Vaginal valve. A thin membrane stretched across the orifice of the vagina, in virgins.
- Hypothesis.* A theory, supposition, law, or doctrine.
- Imperforate.* The congenital closure of any foramen or opening.
- Imperforate Hymen.* Unbroken curtain at the entrance of the vagina of virgins.
- Incision.* A clean cut by a sharp instrument.
- Incisors.* The front teeth.
- Induration.* Hardness of a tissue.
- Inflammation.* A state in which the capillaries of the affected parts are intercepted in their proper functions, and morbidly relaxed and over-distended, causing increased redness, pain and increase of temperature.
- Infusion.* Watery decoction.
- Injection.* Clysters. Fluids forced into the urethra, vagina, uterus, rectum, etc.
- Integument.* That which covers any thing; as the skin, etc.
- Iodine.* Elementary body obtained from sea-weed.
- Irritability.* Susceptibility of excitement from any exciting cause.
- Irritation.* The effect of stimulants.
- Kalognomial.* Compounded from three Greek words, beautiful, woman, law; meaning, the law of female beauty.
- Labia.* Lip.
- Majora. Large, or external lips of the vulva.
- Minora. Small, or internal lips of the vulva.
- Lactation.* Yielding milk. Giving suck to the young.
- Laxative.* A mild purgative.
- Leech.* An aquatic worm.

Leucorrhœa. Whites, a sexual weakness or discharge from vagina, peculiar to females.

Lymph. A thin, transparent fluid, which circulates in the lymphatics.

Lymphatics. Glands or vessels carrying lymph.

Maceration. Softening in water .

Magnesia. One of the earths having a metallic basis.

Malaria. A noxious gas arising from decomposition of vegetable matter.

Maformation. Deformed, defective, irregular, unnatural, ill-formed.

Mammæ. The breasts or the bosom of the female.

Measles. An eruptive fever.

Meatus. A passage.

——Urinarious. Channel or outlet for the urine.

Mens Divina. The Divine Mind.

Menses.) The catamenial or monthly discharge from

Menstruation.) the womb and Fallopian tubes.

Modus operandum. Mode of operation.

Mons Veneris. Prominence above the external opening in the vagina, covered with hair at puberty.

Mucus. Secretions taking place in all mucous membranes.

Nausea. Sickness of stomach.

Nervine. Medicine allaying nervous excitement.

Natura naturans. Nature of Nature herself.

Opium. The concrete juice of the poppy.

Organs. Parts performing a definite function.

Os. A bone.

Ova. Eggs.

Ovaducts. Fallopian tubes.

Ovaries. Two small oval bodies attached to the uterus, one on each side.

Ovasacs. Sacs or bags containing ova.

Oviparous. Producing young from eggs, by hatching, after

- the eggs have passed from the body, as with fowls and birds.
- Ovum.* An egg.
- Oxygen.* One of the most extensively diffused elements in nature. A Constituent of atmospheric air.
- Pancreas.* The gland situated behind the stomach.
- Pancreatic Juice.* The secretion of the pancreas.
- Parenchyma.* The texture of glandular organs, as the liver, etc.
- Parturition.* The act of bringing forth young.
- Pathological.* Morbid changes.
- Pathology.* Doctrine of disease.
- Pelvis.* A basin. The bony cavity which contains part of the intestines, and the urinary and genital organs.
- Peritoneum.* Serous membrane lining the abdominal cavity.
- Phthisis.* Consumption.
- Physiology.* Science of life.
- Placenta.* A soft spongy body adhering to the uterus, and connected with the fœtus by the umbilical cord.
- Polypus.* A tumor growing in the cavities of the body.
- Pregnant.* With child.
- Procreation.* Fecundation. Generation.
- Prolapsus.* Falling of the womb.
- Purulent.* Resembling pus.
- Pus.* Matter produced by suppuration.
- Rash.* Patches of redness on the skin.
- Regimen.* Regulation of diet o as to promote health.
- Roseola.* Rose rash.
- Rubeola.* Measles.
- Scarlatina.* Eruptive fever.
- Schirrous.* Hard.
- Sabaceous Glands.* Glands that secrete the oily matter that lubricates the skin.
- Sedative.* A remedy that lessens arterial and nervous excitement,

Semen. The fluid substance ejaculated by the male in the act of copulation.

Serous. Watery.

Sexual Congress. Coition.

Spermatic Fluid. Semen.

Spermatozoa. Animalculæ contained in the male semen, which impregnate the ova.

Spermatozoon. Singular of spermatozoa.

Stamina. Substance, strength.

Sudorific. Producing perspiration.

Sudorific Glands. Sweat Glands.

Superfætation Impregnation of a woman already pregnant.

Tannic Acid. Astringent property of oak-bark.

Tartar Emetic. Tartarized antimony.

Testes. Testicles. Organs in the male which correspond with the ovaries in the female. Generative organs.

Tribades. Women having abnormal clitorides, or who act toward women as if they were males. A society of women among the ancient Greeks, who indulged in the vice of "Lesbian Love," or unnatural connection with their own sex.

Ulcer. A morbid solution of the continuity of the part.

Umbilical. Navel.

Urethra. Canal or passage to the bladder, through which the urine is evacuated.

Uterus. The womb.

Vagina. The canal leading to the womb, penetrated by the male organ in the act of copulation or coitus.

Vascular. Belonging to vessels.

Vesicle. Bladder of water. A sac.

Viscera. Entrails.

Vis Medicatrix. Vital power of the living body, possessing the power of resisting disease. It also possesses the power of developing organic matter into organized forms.

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